Vol. 938 Number 3

OFFICIAL GAZETTE

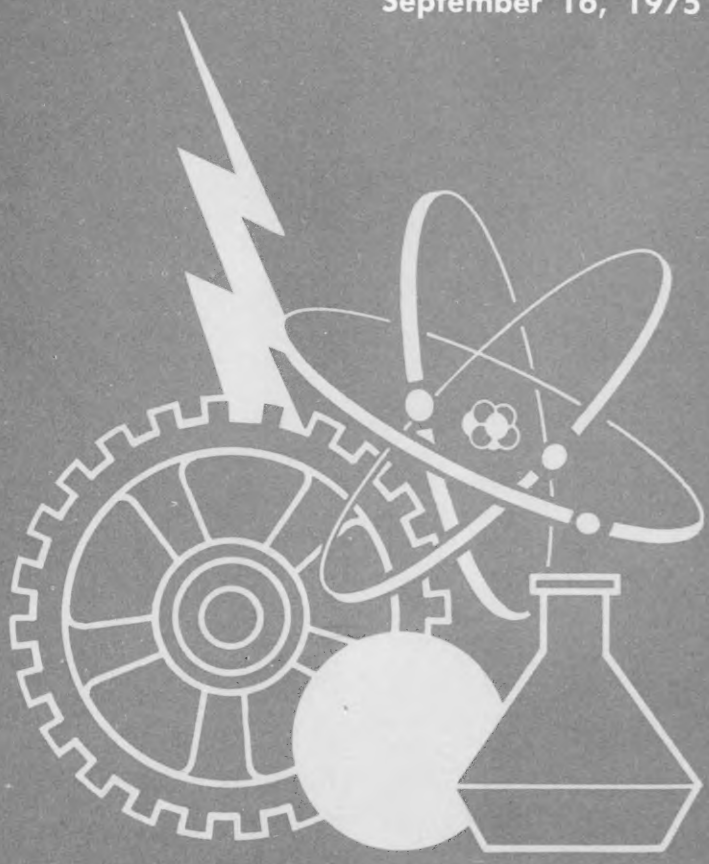
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

AMOCO OIL CO.
SEP 19 1975
RESEARCH LIBRARY

PATENTS

September 16, 1975



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

September 16, 1975 Volume 938 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Administrative Fee	944
Second Trial Voluntary Protest Program	945
Revision Declaration Form	946
Registration to Practice	946
WIPO Vacancy	946
Patent Suits	946
Patent Notices	
Certificates of Correction for the Week of September 16, 1975	948
Condition of Patent Applications	949
Reissue Patents Granted (28,549)	953
Plant Patents Granted (3,781)	953
Patents Granted	
General and Mechanical (3,905,046)	955
Chemical (3,905,761)	1193
Electrical (3,906,143)	1300
Design Patents Granted (236,766)	1439
Index of Patentees	PI 1
Indices of Applicants of Reissues, Plants and Designs	PI 46
Classification of	
Patents (Including Reissues)	PI 49
Designs and Plants	PI 52
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 53
Designs and Plants	PI 55

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum, foreign mailing $85.55 additional; single copies $6 60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Administrative Fees

[37 CFR Parts 1, 2]

Revision

Notice is hereby given that, pursuant to authority contained in 35 U.S.C. 6, as amended (85 Stat. 364), 35 U.S.C. 41, as amended (secs. 1, 2, 79 Stat. 259), and sections 31 and 41, Pub. L. 489, 79th Cong., as amended (sec. 3, 79 Stat. 260, 60 Stat. 440; 15 U.S.C. 1113, 1123), the Patent and Trademark Office proposes to amend §§ 1.21, 1.25 and 1.165 in Part 1, Rules of Practice in Patent Cases, of Title 37 CFR, and § 2.6 in Part 2, Rules of Practice in Trademark Cases.

Interested persons are invited to present their views, objections or suggestions in writing to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, on or before October 15, 1975. No oral hearings will be held. Written comments will be available for examination by interested persons at Crystal Plaza Building 3, Room 11C17a, Arlington, Virginia.

This proposal has been reviewed and determined to have no major inflationary impact.

The proposed amendment of §§ 1.21 and 2.6 would increase a number of the established fees for specified services furnished by the Patent and Trademark Office, and would eliminate established fees for other identified services. One new fee would be established. The purpose of these amendments is to enable the Office to recover the increased material and labor costs incurred in furnishing the identified services, and to eliminate established fees for services which are not currently in demand. However, services for which the established fee has been eliminated will be furnished, if requested, at fees based upon actual cost.

The proposed amendment of §§ 1.25 and 1.165 would bring these rules into conformity with the proposed amendment of § 1.21.

The text of the proposed amendments is as follows:

1. Section 1.21 would be amended by revising paragraphs (e), (j), (k), (l), (m), (q) and (u) to read as follows:

§ 1.21. *Patent and miscellaneous fees and charges.*

* * * * *

(e) For abstracts of title to each patent or application:

For the search, one hour or less, and certificate	$5.00
Each additional hour or fraction thereof	2.50
For each brief from the digest of assignments, of 200 words or less	2.00
Each additional 100 words or fraction thereof	.20

* * * * *

(j) For making patent drawings, when facilities are available, the cost for making the same,

Rate per hour	12.00
Minimum charge per sheet	25.00

(k) For correcting patent drawings, the cost of making the correction,

Rate per hour	12.00
Minimum charge	3.00

(l) [deleted]

(m) [deleted]

* * * * *

(q) List of U.S. Patents:

All patents in a subclass, per sheet (containing 100 patent numbers or less)	1.00
Patents in a subclass, limited by date or patent number, per sheet (containing 50 patent numbers or less)	1.00

* * * * *

(u) Deposit accounts, service charge for each month When the balance at the end of the month is below $40 | 2.00

2. Section 1.25 would be amended by revising paragraph (a) thereof to read as follows:

§ 1.25 *Deposit accounts.*

(a) For the convenience of attorneys, agents, and the general public in ordering services offered by the Office, copies of records, etc., special deposit accounts may be established in the Patent and Trademark Office. A minimum deposit of $50.00 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all services, copies, etc., requested must always be on deposit. A service charge will be assessed for each month that the balance at the end of the month is below $40.00.

* * * * *

3. Section 1.165 would be amended by revising paragraph (b) therein to read as follows:

§ 1.165. *Drawings.*

* * * * *

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings must be submitted. Color drawings may be made either in permanent water color or oil, or in lieu thereof may be photographs made by color photography or properly colored on sensitized paper. Permanently mounted color photographs are acceptable. The paper in any case must correspond in size, weight and quality to the paper required for other drawings. See § 1.84. Nonpermanently mounted copies will be correctly mounted at applicant's expense, § 1.21(v).

4. Section 2.6 would be amended by revising paragraphs (a), (d) and (e), therein, and adding a new paragraph (f), to read as follows:

§ 2.6 *Trademark fees.*

* * * * *

(a) For each printed copy of a registration with data entered of record as of date of mailing, relating to renewal, cancellation, publication under section 12 (c), of the 1946 Trademark Act and affidavits of declarations under sections 8 and 15 of such act,

Omitting title	1.70
Showing title	3.70

* * * * *

(d) For making drawings, when facilities are available, the cost of making the same.

Rate per hour	12.00
Minimum charge per sheet	10.00

(e) For correcting drawings, the cost of making the correction:

Rate per hour (including a photoprint of the uncorrected drawing)	12.00
Minimum charge	3.00

(f) For abstracts of title to each registration or application:

For the search, on hour or less, and certificate	$5.00
Each additional hour or fraction thereof	2.50
For each brief from the digest of assignments, of 200 words or less	2.00
Each additional 100 words or fraction thereof	.20

* * * * *

Approved: August 7, 1975.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

[FR Doc.75-22016; Filed 8-20-75; 8:45 am]

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examing group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and

subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

Revised Declaration Form

A new declaration form has been printed which includes the language required by Rules 65 and 67 (37 CFR 1.65 and 1.67), as revised May 1, 1975, pertaining to inventors' certificates. To facilitate compliance with these rules and to expedite processing of new patent applications, copies of the above-noted form (PTO–1294) are being made available.

Single copies of the new form are available without charge for direct use or for reproduction purposes and may be picked up from the receptionist in Building 3 of the Patent and Trademark Office at Crystal Plaza. Written requests for the form will be filled only if directed to the Commissioner of Patents and Trademarks, Correspondence and Mail Division, Washington, D.C., 20231. A stamped, self-addressed envelope must be enclosed.

WILLIAM FELDMAN,
Acting Assistant Commissioner for Patents.

Aug. 19, 1975.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents & Trademarks on or before October 3, 1975.

Allen, Edward C., 1903 Gatewood Pl., Silver Spring, Md. 20903
Bunsow, Henry C., 3500 Granada No. 362, Santa Clara, Calif. 95051
Cangemi, Salvator J., 61 Sedgefield Dr., Harahan, La. 70123
Caso, Katherine A., 78 Rose Ave., Woodcliff Lake, N.J. 07680
Cosby, Clifton B., 710 Parkway Terr., Alexandria, Va. 22302
D'Andrea, Alfred A., Jr., 459 Hampton Ct., Falls Church, Va. 22046
Dawson, Robert A., 68 Mountain Rd., Cheshire, Conn. 06410
Eriksen, Clarence E., 2100 Transco Tower, Houston, Tex. 77027
Ferguson, Peter D., 54 N. Park St., Fairfield, Iowa 52556
Friaglia, Leo, 12208 Fuller St., Silver Spring, Md. 20902
Huckert, John W., 1925 Cradock St., Silver Spring, Md. 20904
Kaufman, Nathan, 5818 Galloway Dr., Oxon Hill, Md. 20021
Langton, David W. R., P.O. Box 313, Commerce Court Postal Sta., Toronto, Ontario, Canada.
Lawrence, James W., 10237 Brigade Dr., Fairfax, Va. 22030
Malone, Charles A., Mobil Oil Corp., 150 E. 42nd St., New York, N.Y. 10017
Mohr, Michael A., 6845 Radcliffe Dr., Alexandria, Va. 22307
Moss, William D., P.O. Box 313, Commerce Court Postal Sta., Toronto, Ontario, Canada
Parker, Margaret M., 1302 Scott St., Wheaton, Ill. 60187
Pulfrey, Robert E., 3512 Yale Circle, Riverview, Fla. 33569
Reich, Joseph S., 8503 Sundale Dr., Silver Spring, Md. 20910
Simmons, Glen R., Gifford & Gifford, Green City, Mo. 63545
Sukalo, Charles, 4301 23rd Pkway, #509, Hillcrest Heights, Md. 20031
Sutherland, Henry C., 1232 Daleview Dr., McLean, Va. 22101
Williams, Carrie W., Eastman Kodak, 343 State St., Rochester, N.Y. 14650
Young, Barry N., 128 Drexel Dr., Millersville, Md. 21108

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

WIPO Vacancy

WIPO has announced its intention to fill a vacancy in the position of Counsellor (Industrial Property Division) at either a level P.4 or P.5, depending upon the qualifications and experience of the selected candidate. The duties of this position will include: participation in surveys concerning the revision of Conventions and Agreements administered by WIPO and the elaboration of drafts of new treaties; undertaking studies on license agreements, know-how and trade secrets and participation in the elaboration of model laws for developing countries; representation at international meetings; and preparation of working documents and reports.

The qualifications required are a law degree or equivalent legal qualifications; experience in international aspects of intellectual property activities; ability to undertake legal studies and to draft legislative texts; ability to act as WIPO representative at international meetings.

The candidate must be less than 50 years of age for appointment at a P.4 level and less than 55 years of age for appointment at a P.5 level.

At the P.5 level, without dependents, the annual salary ranges from about $32,000 to $37,000, including post adjustments. With dependents, the annual salary ranges from $37,000 to $43,000 including post adjustments. At the P.4 level the annual salary ranges from about $26,000 to $33,000 without dependents, and from $31,000 to $39,000 with dependents. For either level, there are dependency allowances of $400 for a dependent spouse and $470 for each dependent child and an education grant of up to $1,500 for each child under 21.

Applications and information on WIPO Competition No. 257 can be obtained either from the Director of Administrative Division, World Intellectual Property Organization (WIPO), 32 chemin des Colombettes, 1211 Geneva 20, Switzerland or the Office of Legislation and International Affairs, Crystal Plaza Building 6, Room 1108. Closing date for receipt of application is September 30, 1975.

Date: Aug. 26, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,712,584, S. Pantages, POTENTIOMETERS; **2,745,915,** same, MULTIPLE REMOTE CONTROL SWITCH, **filed** May 12, 1975, D.C., S.D.N.Y., Doc. 75–C–2246, *Steven Pantages* v. *Litton Industries, Inc.*

2,745,915. (See 2,712,584.)

2,849,113, Bourne and Harrison, METHOD OF AND MEANS FOR HANDLING FLOTATION MIDDLINGS IN ORE CONCENTRATION PROCESSES; **2,984,348,** Adams and Dancy, BENEFICIATION OF POTASH ORES; **3,026,194,** Smith and Witman, POTASH TREATING PROCESS, **filed** May 20, 1975, D.C., S.D. Tex (Houston), Doc. 75–H–789, *Duval Corporation* v. *Texasgulf, Inc.*

2,948,871, T. L. Craige, MINIATURE INDUCTIVE DEVICES, **filed** Dec. 4, 1968, D.C., S.D.N.Y., Doc. 68–C–4817, *TRW Inc.* v. *Pico Electronics, Inc. et ano.* Filed stipulation and order of dismissal pursuant to Rule 41(a)1, without prejudice, Jan. 20, 1975.

2,984,348. (See 2,849,113.)

2,988,849, M. P. Laughlin, MEANS FOR APPLYING PLANT GROWTH CONTROL CHEMICALS, **filed** Aug. 13, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2073, *Discovery Rights, Inc.* v. *Avon Products, Inc.* By agreement order the complaint and counterclaim dismissed with prejudice, Dec. 12, 1974.

2,993,946, G. S. Lozier, PRIMARY CELLS, **filed** May 15, 1975, U.S. Court of Claims (District of Columbia), Doc. 165–75, *RCA Corporation* v. *The United States.*

3,026,194. (See 2,849,113.)

3,066,382, Zweigle and Humbert, STRANDED ALKENYL AROMATIC POLYMER FOAM FOR LOOSE-FILL PACKAGING, **filed** May 13, 1975, D.C.N.J. (Newark), Doc. 75–815, *The Dow Chemical Company* v. *Creative Displays Inc., Ampco Division.*

3,116,557, J. R. Trice, Jr., METHOD AND MEANS FOR LAYING SEWER PIPE, **filed** Jan. 28, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c243, *Laser Alignment, Inc.* v. *Spectra-Physics, Inc.* Enter stipulated order of dismissal, Oct. 4, 1974.

3,293,130, Slater and Kucera, PANLEUKOPENIA VACCINE AND METHOD FOR THE PRODUCTION THEREOF; **Reg. No. 856,896** (LEUKOGEN-TC.), Phillip Roxane, Inc., **filed** Mar. 4, 1970, D.C. Kans. (Kansas City), Doc. KC–3113, *Philips Roxane, Inc.* v. *Biotec Labs., Inc. and Dale A. King.* Order of dismissal, plaintiff's action for infringement of patent dismissed against both defendants. Plaintiff's cause of action for trademark infringement and unfair competition and plaintiff's action for use of trade secrets dismissed with prejudice. Defendant's counterclaims dismissed against plaintiff, Apr. 7, 1971.

3,297,419, E. E. Eyre, Jr., SYNTHETIC FUEL LOG AND METHOD OF MANUFACTURE, **filed** May 15, 1975, D.C., E.D. Va. (Norfolk), Doc. C/A 75–221–N, *Great Lakes Carbon Corporation* v. *Gold Kist Inc.*

3,351,168, Sander and Svensson, AUTOMATIC SLACK ADJUSTER FOR VEHICLE BRAKES, **filed** May 21, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1638, *SAB Bromsregulator* v. *Eaton Corp. Inc. and Berg Manufacturing Company.*

3,478,606, W. H. Pederson, APPARATUS FOR INDICATING THE RELATIVE MOVEMENT OF A SNOWMOBILE, **filed** Oct. 11, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2607, *Walter H. Pederson* v. *Stewart-Warner Corporation.* Plaintiff's patent is valid. Partial judgment entered in the verdict in favor of plaintiff and against defendant, Apr. 29, 1975.

3,484,792, M. I. Gold, ELECTROSTATIC RECORDING METHOD AND APPARATUS FOR REDUCING RECORDING AREA OF A STYLUS, **filed** May 28, 1975, D.C. Mass. (Boston), Doc. 75–2088–S, *EG & G, Inc.* v. *Xerox Corporation.*

3,519,235, L. E. Walter, FOLDING SIGN SUPPORT, **filed** May 20, 1975, D.C. Conn. (Hartford), Doc. H75–165, *Walter Sign Corp.* v. *Continental Products, Inc.*

3,594,260, P. Dieffenbach, ARTIFICIAL SHRUBBERY AND METHOD OF MANUFACTURING THE SAME, **filed** June 15, 1973, D.C., S.D.N.Y., Doc. 73–2693, *Masterpiece of Pennsylvania, Inc.* v. *Consolidated Novelty Co. Inc.* Judgment ordering defendant be permanently enjoined from using the term "Alpine King," May 15, 1975.

3,600,560, Gosselin and Melanson, RATE/TIME COMPUTER, **filed** May 27, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75–1767–EC, *Prestige Office Products, Inc.* v. *Centrodyne Corporation of America.*

3,620,367, O. G. Stembel, CASSETTE STORAGE CONTAINER, **filed** May 21, 1975, D.C. Minn. (St. Paul), Doc. 3–75–172, *Blackbourn, Inc.* v. *A. Dudley Olsen.*

3,704,876, J. J. Schubeck, TRACTION DEVICE, **filed** Sept. 5, 1973, D.C., N.D. Ohio (Cleveland), Doc. C73–940, *The Scott and Fetzer Company* v. *Summit Auto Parts and Racing Equipment and E/T Products, Inc.* Consent judgment entered in favor of the plaintiff and against the defendants, May 9, 1975.

3,717,339, Holkesvick, Hudnall and Adams, METHOD OF UNASSISTED FRICTION-RESISTIVE EXERCISING, **filed** June 22, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1445–RJK, *Diversified Products Corporation* v. *Exer-Genie, Inc., and Edgar E. Holkesvick.* Claim for alleged invalidity and noninfringement, and counterclaim for alleged infringement be dismissed without prejudice, Sept. 23, 1974.

3,763,592, A. A. Den Ouden, ANIMAL WITH HARD AND SOFT BODY PORTIONS SIMULATED BY HARD AND SOFT MOULDINGS, **filed** May 21, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–1726–DWW, *Imperial Toy Corporation* v. *Creation and Distribution, Ltd.*

3,792,163, S. J. Fudro, EGG DECORATING DEVICE; **Reg. No. 970,678** (DECOREGGER), Spearhead Marketing, Inc., **filed** Mar. 17, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c860, *Spearhead Marketing, Inc.* v. *Toys "R" Us, Inc.*

3,814,343, Bennett and Haller, AUTOMATIC TAPE LOADING APPARATUS FOR CASSETTES AND THE LIKE, **filed** May 19, 1975, D.C. Mass. (Boston), Doc. 75–1961–F, *Programming Technologies, Inc.* v. *King Instrument Corporation.*

3,814,416, Munger and Kirby, PLAYGROUND CLIMBING STRUCTURES; **Reg. No. 994,912** (BIG TOYS), Northwest Design Products, Inc., **filed** May 23, 1975, D.C. Fla. (Jacksonville), Doc. 75–310–C–J–S, *Northwest Design Products, Inc.* v. *Advanced Playgrounds, Inc. and Wayne Whalen.*

3,826,987, J. D. Stevens, MINIATURE RADIO RECEIVER; **D. 232,767,** same, **filed** May 21, 1975, D.C.N.J. (Newark), Doc. 75–873, *A. K. Hoch Manufacturing Company* v. *Robbins Radio, Inc., also known as Robbins Novelty and Thomas Robbins and The Benson East.*

3,844,000, J. Hedu, CLASP; **D. 200,155,** same, CLASP FASTENER OR SIMILAR ARTICLE, **filed** May 23, 1975, D.C.N.J. (Newark), Doc. 75–889, *The Siemon Company* v. *E-Z Buckle, Inc.*

3,853,217, Scordato and Cohen, PIPETTE TIP PACKAGE, **filed** May 21, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1636 *Medical Laboratory Automation, Inc.* v. *Robert A. Stough & Company.*

D. 232,767. (See 3,826,987.)

D. 234,239, S. Long, SOFA, **filed** May 22, 1975, D.C., E.D. Tenn. (Greeneville), Doc. C–2–75–69, *The Berkline Corporation* v. *The Bean Station Furniture Factory, Inc. and Ben Jarnigan.*

Reg. No. 749,723. (See 3,717,339.)

Reg. No. 970,678. (See 3,792,163.)

Reg. No. 994,912. (See 3,814,416.)

Certificates of Correction for the Week of Sept. 16, 1975

D. 234,301	3,849,767	3,879,668	3,890,063
D. 234,570	3,850,713	3,879,928	3,890,086
D. 234,935	3,852,142	3,880,020	3,890,141
D. 234,955	3,852,415	3,880,268	3,890,183
D. 235,302	3,852,683	3,880,473	3,890,355
3,303,031	3,856,764	3,881,693	3,890,360
3,306,825	3,856,853	3,881,966	3,890,435
3,369,012	3,857,887	3,882,231	3,890,517
3,376,229	3,858,240	3,882,350	3,890,533
3,640,203	3,860,375	3,882,702	3,890,598
3,738,461	3,860,771	3,882,821	3,890,818
3,756,057	3,861,833	3,883,119	3,890,862
3,756,377	3,862,861	3,883,144	3,890,876
3,758,192	3,863,104	3,883,558	3,891,448
3,761,412	3,863,474	3,883,956	3,891,652
3,761,898	3,864,658	3,883,972	3,891,660
3,765,952	3,865,826	3,884,243	3,891,811
3,767,935	3,866,079	3,884,564	3,891,892
3,771,262	3,868,250	3,884,684	3,891,969
3,774,412	3,869,957	3,884,769	3,892,000
3,781,579	3,870,142	3,885,033	3,892,115
3,790,355	3,870,655	3,885,050	3,892,229
3,794,984	3,870,716	3,885,201	3,892,242
3,794,995	3,870,981	3,885,207	3,892,436
3,798,915	3,871,568	3,885,602	3,892,516
3,808,167	3,871,633	3,886,003	3,892,541
3,810,865	3,872,018	3,887,066	3,892,610
3,813,908	3,872,074	3,887,243	3,892,800
3,813,984	3,873,450	3,887,252	3,892,801
3,818,859	3,873,501	3,887,271	3,893,097
3,819,068	3,873,825	3,887,288	3,893,502
3,821,287	3,874,027	3,887,505	3,893,516
3,821,323	3,875,215	3,887,684	3,893,664
3,824,015	3,876,334	3,887,750	3,893,915
3,824,281	3,877,054	3,887,823	3,894,076
3,825,369	3,877,089	3,887,845	3,894,097
3,829,206	3,877,160	3,888,097	3,894,224
3,830,681	3,877,626	3,888,477	3,894,430
3,832,046	3,878,021	3,888,575	3,894,486
3,833,204	3,878,326	3,888,710	3,894,556
3,833,687	3,878,698	3,888,723	3,894,641
3,837,855	3,878,748	3,889,152	3,895,163
3,839,986	3,878,764	3,889,218	3,895,555
3,840,514	3,878,817	3,889,224	3,895,852
3,843,431	3,879,315	3,889,507	3,895,943
3,845,056	3,879,366	3,889,533	3,896,106
3,846,172	3,879,368	3,889,669	
3,846,583	3,879,576	3,889,729	
3,849,248	3,879,645	3,889,879	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 30, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-27-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-17-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-4-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-2-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Tesing; Indicating.	1-23-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-3-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.: Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-6-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-27-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-22-75

Expiration of patents: The patents within the range of numbers indicated below expire during September 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,849,714 to 2,854,668 inclusive
Plant Patents..... Numbers 1,746 to 1,757 inclusive

REISSUES

SEPTEMBER 16, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

Re. 28,549

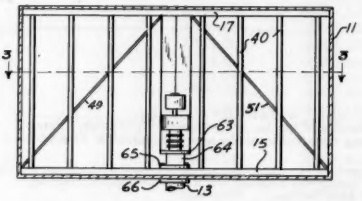
INVISIBLE DRIVE UNIT FOR LARGE DISPLAY SIGNS

James W. Bevan, Salt Lake City, Utah, assignor to Specialty Engineering & Manufacturing Co., Salt Lake City, Utah

Original No. 3,427,738, dated Feb. 18, 1969, Ser. No. 614,431, Feb. 7, 1967. Continuation of Ser. No. 871,807, Oct. 29, 1969, abandoned. Application for reissue Sept. 9, 1970, Ser. No. 70,944

Int. Cl. G09f *11/10, 13/00*

U.S. Cl. 40—33 **6 Claims**



1. In a large movable internally illuminated sign having translucent side walls of large area spaced apart a given distance, said sign being mountable on a tall support pole and having a series of spaced elongated light source elements arranged substantially in a row or plane between the side walls and close enough together to furnish overlapping illumination to illuminate with substantial equality the entire inner areas of said side walls, the improvement which comprises a rigid support member and a drive mechanism supported by said support member for moving said sign, said mechanism occupying only a slender columnar space of substantially smaller overall transverse dimension than either the distance between said spaced side walls or the spacing between a pair of contiguous light source elements, said mechanism including a drive motor within said columnar space and adapted to be positioned between a pair of contiguous light source elements, a gear reduction device located entirely within said columnar space and commutator means also in this said columnar space for supplying electrical energy to said motor and to said light sources, the arrangement being such that with the drive mechanism mounted inside the sign all parts of said interior wall surfaces receive substantial overlapping illumination from a plurality of the nearest ones of said light source elements, whereby the drive mechanism is mountable within the internal illuminated area of the sign without casting substantial shadows.

Re. 28,550

MARINE HARDWARE

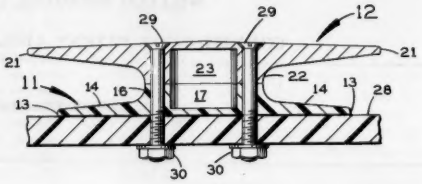
Marvin S. Perkins, North Miami Beach, Fla., assignor to Perkins Marine Lamp and Hardware Corporation, Miami, Fla.

Original No. 3,828,714, dated Aug. 13, 1974, Ser. No. 153,603, June 16, 1971. Application for reissue Oct. 17, 1974, Ser. No. 515,514

Int. Cl.[2] B63B *21/08*

U.S. Cl. 114—218 **1 Claim**

1. For use with a marine device having a plastic or metal surface a [cleat] *marine accessory device* including a first member formed of a relatively flexible organic polymeric resin and adapted to be fixedly superimposed on the said surface of the marine device and comprising a longitudinally extending base section and a first post section integrally formed with and projecting upwardly from said base section to extend outwardly from said surface, and a second member formed of a relatively rigid metal and comprising a longitudinally extending arm cooperatively overlying said base section and a second post section integrally formed with and depending from said arm and disposed in aligned end to end engagement with said



first post section, and fastening means passing through said posts for securing said members together and for anchoring said first member onto the surface.

Re. 28,551

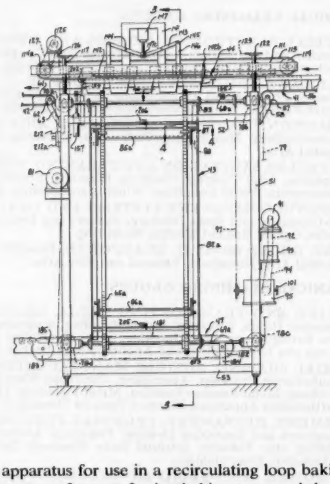
APPARATUS FOR TRANSFERRING TRAYS BETWEEN A CONVEYOR SYSTEM AND A STACK

Johnnie J. Breitbach, 7 Plymouth Ct., Normal, Ill. 61761

Original No. 3,770,143, dated Nov. 6, 1973, Ser. No. 195,627, Nov. 4, 1971. Application for reissue July 18, 1974, Ser. No. 489,823

Int. Cl.[2] B65G *60/00*

U.S. Cl. 214—6 DS **23 Claims**



1. An apparatus for use in a recirculating loop baking tray conveyor system for transferring baking trays and the like of ferromagnetic material between a tray conveyor system and a stack comprising:

said recirculating loop baking tray conveyor system including inlet and outlet tray conveyor sections each adapted to underlie and support baking trays at a selected level and having adjacent ends spaced apart a distance substantially greater than the length of a tray,

stack elevator means for supporting an upright stack of trays between said adjacent ends of said inlet and outlet tray conveyor sections, said stack elevator means including laterally spaced endless chains extending vertically

downwardly from adjacent said preselected level at relatively opposite sides of the path of travel of the trays on the overhead conveyor means, said laterally spaced chains having stack supports at spaced locations therealong adapted to underlie and support the lowermost tray in a stack disposed between the chains, means for sensing the level of the top of the stack of trays between said chains, and elevator [dirve] *drive* means responsive to said stack level sensing *means* for driving said chains to position the top tray in the stack at a level slightly below said selected level of said inlet and outlet tray conveyor sections,

said baking tray conveyor system including an endless type overhead conveyor means having a generally horizontal lower run dimensioned to at least span the space between the inlet and outlet conveyor sections, magnetic means cooperable with said lower run for magnetically holding the top of a ferromagnetic baking tray against the lower run for movement therewith, and means mounting said overhead conveyor means for vertical adjustment relative to said inlet and outlet conveyor sections and to said endless chains of said stack elevator means to position said overhead conveyor means with its lower run at a level spaced above the selected level of the inlet and outlet tray conveyor sections a distance corresponding to the height of the baking trays to allow trays to move from the inlet conveyor section along the lower run of the overhead conveyor and onto the outlet section for recirculating the trays,

and tray transfer means intermittently operable to transfer trays between the overhead conveyor means and the stack.

20. An apparatus for use in a recirculating loop baking tray conveyor system for transferring baking trays and the like of ferromagnetic material between a tray conveyor system and a stack comprising:

said recirculating loop baking tray conveyor system including inlet and outlet tray conveyor sections each adapted to underlie and support baking trays at a selected level and having adjacent ends spaced apart a distance substantially greater than the length of a tray,

stack elevator means for supporting an upright stack of trays between said adjacent ends of said inlet and outlet tray conveyor sections, said stack elevator means including laterally spaced endless chains extending vertically downwardly from adjacent said preselected level at relatively opposite sides of the path of travel of the trays on the overhead conveyor means, said laterally spaced chains having stack supports at spaced locations therealong adapted to underlie and support the lowermost tray in a stack disposed between the chains, means for sensing the level of the top of the stack of trays between said chains, and elevator drive means responsive to said stack level sensing means for driving said chains to position the top tray in the stack at a level slightly below said selected level of said inlet and outlet tray conveyor sections,

said baking tray conveyor system including an endless type overhead conveyor means having a generally horizontal lower run dimensioned to at least span the space between the inlet and outlet conveyor sections and spaced above the selected level of the inlet and outlet tray conveyor sections a distance corresponding to the height of the baking trays to allow trays to move from the inlet conveyor section along the lower run of the overhead conveyor and onto the outlet section for recirculating the trays, magnetic means cooperable with said lower run for magnetically holding the top of the ferromagnetic baking tray against the lower run for movement therewith,

tray stop means mounted for movement between an operative position in the path of movement of trays along said overhead conveyor means and an inoperative position out of the path of movement of said trays,

tray transfer means operable to transfer trays between the overhead conveyor means and the stack, means operative when a tray engages said tray stop means for operating said transfer means to move a tray from the overhead conveyor means to a stack on said elevator means,

means for sensing a back-up of trays at a location along said tray conveyor system, and means responsive to said last-mentioned means for moving said tray stop means from said inoperative position to said operative position when a back-up of trays is sensed.

Re. 28,552

COBALT-BASE ALLOYS

Gaylord Darrel Smith, Mountainside, N.J., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Original No. 3,410,732, dated Nov. 12, 1968, Ser. No. 452,382, Apr. 30, 1965. Application for reissue Aug. 16, 1974, Ser. No. 498,230

Int. Cl. C22c *19/00*

U.S. Cl. 148—32 **11 Claims**

1. An alloy composition consisting essentially of at least 50% cobalt, 14–30% molybdenum, 6–12% chromium and 0.5–4% silicon, said alloy having a micro-structure containing 30–60 volume percent of a hard Laves phase and, correspondingly, 40–70 volume percent of a solid solution matrix phase.

Re. 28,553

METHOD FOR INHIBITING CORROSION AND MINERAL DEPOSITS IN WATER SYSTEMS

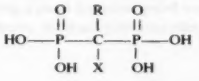
Helmut von Freyhold, Dusseldorf-Oberkassel, Germany, assignor to Henkel ½ Cie GmbH, Dusseldorf-Holthausen, Germany

Original No. 3,723,333, dated Mar. 27, 1973, Ser. No. 821,487, May 2, 1969. Continuation of Ser. No. 821,487, May 2, 1969, abandoned. Application for reissue July 24, 1974, Ser. No. 491,384

Int. Cl.² C23F *11/18*

U.S. Cl. 252—175 **14 Claims**

1. A method for inhibiting corrosion and mineral deposition in a water system comprising the steps of adding to said water system from 1 mg./liter of said water up to 1½ times the quantity which is necessary for substantially completely converting into complexes the substances imparting hardness to said water, of a composition comprising a first compound selected from the group consisting of a diphosphonic compound of the formula



wherein X is OH or NH_2, and R is an alkyl of 1 to 5 carbon atoms, water soluble salts of said diphosphonic compound, and a mixture of said diphosphonic compound and said water-soluble salts thereof; and a second compound selected from the group consisting of water-soluble, complex forming compounds containing at least one radical selected from the group consisting of [phosphonates and] N-dimethylenephosphonic acid radicals, water soluble salts thereof and mixtures of said compounds and their water soluble salts; said first and second compounds are present in said composition in molar ratio of from 1:3 to 3:1 and from 0.5 to 500 mg./liter of water of an inhibitor selected from the group consisting of (A) water-soluble orthophosphates, water soluble zinc salts and mixtures thereof and (B) alkali metal silicates, alkali metal nitrites, and mixture thereof.

Re. 28,554

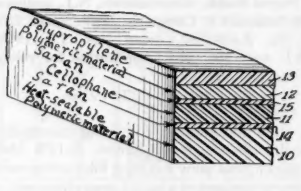
FLEXIBLE WRAPPING MATERIAL

Howard J. Curler, and Glenn E. Lineburg, both of New London, Wis., assignors to Curwood, Inc., New London, Wis.

Original No. 3,445,324, dated May 20, 1969, Ser. No. 599,566, Dec. 6, 1966. Continuation-in-part of Ser. No. 280,200, May 14, 1963, abandoned. Application for reissue Aug. 9, 1971, Ser. No. 164,901

Int. Cl.[2] B32B *23/08, 27/30, 27/32*

U.S. Cl. 428—334 22 Claims



1. A flexible, laminated, heat-sealable wrapping material particularly suitable for use in the packaging of food products and other products which are to be maintained in hermetically sealed relationship to the atmosphere, and in which the package is of the nonconforming type whereby the wrapping material may be subjected to considerable flexing and bending which is conducive to flex cracking of the material and the development of pinholes therein, said material being characterized by its resistance to flex cracking and pinhole development, and by its imperviousness to gas and moisture, comprising a cellophane sheet, coated with a layer of a vinylidene chloride copolymer, and sandwiched between and bonded on one side to a polymeric layer having good heat-seal strength, and bonded on the other side, by a layer of bonding material, to a biaxially oriented polypropylene sheet treated on its inner face to facilitate bonding so that said polypropylene sheet forms one surface of said laminated material, and said polymeric layer forms the opposite surface of said material, said polymeric layer being heat-sealable at a temperature substantially below the melting point of said polypropylene sheet, and said polymeric layer being selected from a group consisting of polyethylene and ethylene-vinyl acetate copolymers.

Re. 28,555

ELECTRICAL SWITCH HAVING MOVABLE SPRING CONTACTS WHICH PROVIDE WIPING ACTION WITH ASSOCIATED STATIONARY CONTACTS

John Albert Koepke, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Original No. 3,860,775, dated Jan. 14, 1975, Ser. No. 416,489, Nov. 16, 1973. Application for reissue Jan. 29, 1975, Ser. No. 545,256

Int. Cl.[2] H01H *1/36*

U.S. Cl. 200—164 R 4 Claims

1. An electrical switch comprising a housing, a switching station comprising a pair of electrically conductive leads each having a stationary contact means thereon, an actuator movable in said housing between first and second positions and having a contact support member associated with said pair of leads, resilient means for biasing said actuator toward its first position and a movable electrical contact means supported by said support member, said movable contact means having first and second *generally J-shaped* resilient contact sections that are joined by a *generally U-shaped* connecting section, [and] said first and second *J-shaped* contact sections having segments which are spaced from an adjacent portion of their respective support member when the electrical circuit between said pair of leads is open and which are deflected towards said adjacent portion of said support member by said stationary contact means when said electrical circuit is closed so as to provide a wiping action between said movable and said stationary contact means, [said movable contact means further having a generally U-shaped connection section and a pair of generally] *said* J-shaped sections [which] *being constructed to* face each other [and which] *so as to* diverge outwardly from said U-shaped section at an acute angle, and said support member being constructed to receive said U-shaped connecting section and having a pair of bifurcated arms which are in engagement with said J-shaped sections only at the outer area thereof when said electrical circuit is open.

PLANT PATENTS

GRANTED SEPTEMBER 16, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,781
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Aug. 19, 1974, Ser. No. 498,865
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia characterized particularly as to uniqueness by its prolific self-branching habit allowing for a very full plant; short, compact growth giving a dwarf type appearance; its ability to be easily propagated by leaf as well as stem cuttings; small semi-double azalea type flowers which bloom continuously for up to six to eight months; very small foliage with sharp serrations, and by its superior versatility which permits the cultivar to be grown either as a small plant for the home or as a large plant for display.

3,782
KENTUCKY BLUEGRASS
Cyril Reed Funk, Jr., East Brunswick, N.J., assignor to Rutgers University, New Brunswick, N.J.
Filed Feb. 19, 1974, Ser. No. 443,377
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A variety of bluegrass plant, substantially as shown and described.

3,783
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Feb. 28, 1974, Ser. No. 446,787
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *elatior* begonia characterized particularly by its salmon pink color, the pastel shade increasing the color range of begonias of this class; its two inside tepals which have a slight ruffle and a noticeable incurving of the exterior tips; its rapid rooting; its consistency to propagate from leaf cuttings that root in three weeks, thereafter producing adventitious shoots, and by its lush and durable foliage.

3,784
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Mar. 7, 1974, Ser. No. 449,019
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive cultivar of *elatior* begonia characterized particularly by its bright, deep red flower color; consistent tendency to have 5–6 tepals per flower; relatively slow rooting and growth habits; dark green, heavy foliage with indentations on edges; superior flower texture and quality, and by its ability to maintain greater numbers of flowers in bloom at any one time when compared to the parent cultivar Schwabenland.

3,785
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Aug. 19, 1974, Ser. No. 498,866
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia characterized particularly by its clear white, ruffled edge, double azalea type flowers having light chartreuse infusion on the back side of the tepals; its profuse blooming habit and by its ease of propagation both by stem and leaf cuttings.

PATENTS

GRANTED SEPTEMBER 16, 1975

ERRATA

For CLASS	See PATENT NO.
228-173	3,905,092
073-382	3,905,215
073-295	3,905,243
092-143	3,905,281
128-140	3,905,335
233-026	3,905,528
221-155	3,905,530
273-075	3,905,598
251-077	3,905,689
425-113	3,905,749
106-062	3,905,845
136-131	3,905,851
280-011.35-C	3,905,906
250-536	3,905,920
423-540	3,906,039
310-009.1	3,906,249
290-001	3,906,250
357-007	3,906,296
315-005.42	3,906,300
315-097	3,906,301
315-209	3,906,302
315-370	3,906,303
315-379	3,906,304
315-399	3,906,305
315-408	3,906,306
317-002 E	3,906,308
317-018 R	3,906,309
317-033 VR	3,906,310
317-230	3,906,311
317-260	3,906,312
340-007 R	3,906,352
328-031	3,906,366
329-104	3,906,376
329-122	3,906,380
346-074	3,906,501
343-895	3,906,514

PATENTS

GRANTED SEPTEMBER 16, 1975

GENERAL AND MECHANICAL

3,905,046

LAMINATED STRAP WITH DECORATIVE STITCHING

Hermann Hirsch, Klagenfurt, Austria, assignor to Hans Hirsch & Sohne Ohg Leder- und Kunststoffwarenfabrik, Klagenfurt, Austria

Filed Apr. 30, 1974, Ser. No. 465,681
Claims priority, application Austria, Nov. 26, 1973, 9893/73
Int. Cl.[2] A41F *3/02*, *9/00*, *19/00*
U.S. Cl. 2—338 5 Claims

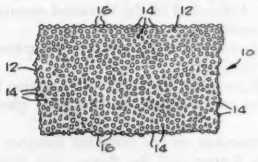
1. A strap comprising an outer layer and a lining adhesively bonded to the outer layer, and decorative stitching extending through only the outer layer and secured between said outer layer and said lining, whereby said stitching is adhesively fixed so that when said stitching has chafed through said stitching cannot be pulled out.

3,905,047

IMPLANTABLE CERAMIC BONE PROSTHESIS

Roger A. Long, Escondido, Calif., assignor to John J. Posta, Jr., Northridge, Calif.

Filed June 27, 1973, Ser. No. 373,959
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.9 10 Claims



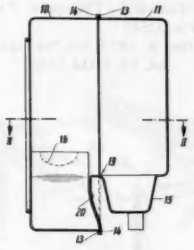
1. An improved implantable bone prosthesis, said prosthesis comprising a unitary ceramic body containing a eutectic of metal pyrophosphate and refractory oxide, wherein said body includes discrete particles of refractory oxide bonded together by said eutectic, whereby said eutectic bonds together the discrete particles of refractory oxide in such a manner that no substantial degradation of said discrete particles by the eutectic occurs.

3,905,048

ROOM MODULES WITH SANITARY DEVICES

Hans Gunter Moller, Oldenburger Landstr. 50, 287 Delmenhorst, Germany

Filed Apr. 10, 1973, Ser. No. 349,880
Claims priority, application Germany, Apr. 26, 1972, 2220437
Int. Cl.[2] A47K *4/00*
U.S. Cl. 4—2 4 Claims



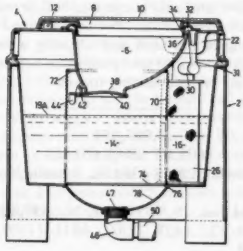
1. A moulding comprising a deep-drawn thermoplastics panel with integrally moulded sanitary devices such as a bath tub, shower tray, W.C. pan and the like for forming room modules or so-called sanitary cells by the assembly of two room halves along a longitudinal median plane defined by the outer edged of each half characterized in that at least one of the integrally moulded sanitary devices has an outer wall which projects outside the outer edge beyond the longitudinal median plane defined by the edges which are joined to each other.

3,905,049

TOILETS

John H. Stokes, Caterham, and Raymond Bondon, Norwich, both of England, assignors to Elsan Limited, London, England

Filed Oct. 30, 1973, Ser. No. 411,179
Claims priority, application United Kingdom, Oct. 30, 1972, 49987/72
Int. Cl.[2] E03D *1/00*, *3/00*, *5/00*
U.S. Cl. 4—10 2 Claims



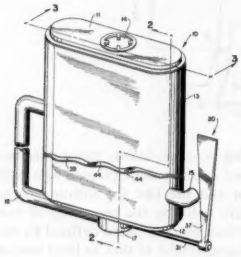
1. A toilet comprising a toilet bowl, a receiving chamber beneath the bowl, the receiving chamber having a bottom of bowl-shape with an outlet opening at its lowest point and having an enclosing wall at least a large part of which is of filter material, a pump chamber outside the enclosing wall, a pump of piston and cylinder type, with its axis vertical, having

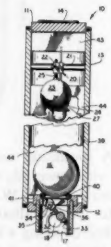
an intake lying at the lower end of the pump cylinder and within the pump chamber, a second-stage cylindrical filter entirely surrounding the pump and a third-stage filter protecting the intake, and means enabling the pump to recirculate liquid from the pump chamber to the bowl for flushing.

3,905,050
PRESSURIZED FLUSH TANK

Alva L. Goza, Rt. 1, Box 215, Gulf Breeze, Fla. 32561; Fay D. Smith, 101 Magnolia St., Cantonment, Fla. 32533; L. E. Bentkowski, 2110 E. Lakeview, Pensacola, Fla. 32505; Donald W. Evans, P.O. Box 1206, Ft. Walton Beach, Fla. 32548; Ronald P. Blake, 505 Mooney Rd., Ft. Walton Beach, Fla. 32548, and Jimmie L. Thompson, P.O. Box 3186, Ft. Walton Beach, Fla. 32548

Filed Dec. 5, 1973, Ser. No. 421,954
Int. Cl. E03d *3/00*
U.S. Cl. 4—28 **3 Claims**





1. A pressurizable flush tank comprising a water inlet for introducing water into said tank, means for producing a selected water level within said tank, a discharge line for discharging water from said tank, a purge line having a first end disposed within said tank below said selected water level and a second end in communication with said discharge line, a first valve means for selectively closing said discharge line, and a second valve means for selectively closing said first end of said purge line, said second valve means including a float raisable by water within said tank, an arm carrying said float and pivotal by motion of said float, and a valve member carried by said arm and engageable with said one end of said purge line, said purge line having associated therewith a seating means attached to said first end disposed within said tank below said selected water level in spaced relation with said arm, said float means and said second value means such that water within said tank will flow into said purge line before said arm pivots to cause said valve member to close said first end of said purge line during filling of the tank and whereby a predetermined amount of water flows into said purge line before said second valve means seats on said seating means.

3,905,051
TOILET SEAT CHAIR

Charles Gozdziewski, 28-48 43rd St., Astoria, New York, N.Y. 11103

Filed Jan. 28, 1974, Ser. No. 437,420
Int. Cl.[2] A47K *11/02;* **A61L** *11/00*
U.S. Cl. 4—134 **7 Claims**

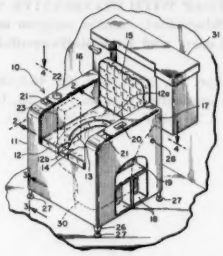
1. A toilet seat chair for improved comfort for connecting to a commode comprising:

a pair of spaced apart arm rests which define a seat opening;

a back rest portion coupled between the arm rests and the seat portion;

an elongated bolt inserted through the arm rests of the chair and engaging the hinge brackets of the commode so as to anchor the arms of the chair to the commode; and

adjustable leg means consisting of at least one pair of feet threadably coupled to the legs of the chair for raising and lowering the height of the chair; so that the bolt through

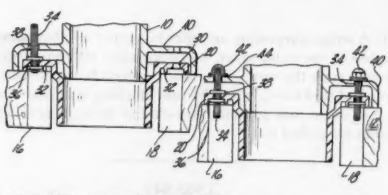


the arm rests can be adjusted to be in axial alignment with the hinge brackets of the commode.

3,905,052
METHOD AND APPARATUS FOR MOUNTING A PLUMBING FIXTURE

Costanzo DeAngelis, 23720 Glenn St., Westland, Mich. 48185

Filed Jan. 7, 1974, Ser. No. 431,075
Int. Cl.[2] E03D *11/00, 11/13*
U.S. Cl. 4—252 R **4 Claims**



1. A plumbing assembly, comprising:

a support having an opening;

a hold-down ring having a body mounted in said support opening and a flange seated on the support about the opening, the flange having a flange opening;

a plumbing fixture mounted on the support, said plumbing fixture having an opening adjacent said flange opening;

an elongated threaded member disposed in the flange opening and the fixture opening such that an upper end of the threaded member is above the fixture opening and the opposite, lower end of the threaded member below the flange opening;

a lower nut mounted on the threaded member beneath the flange;

first means carried by the flange for engaging the lower nut to prevent its rotation as the threaded member is being rotated;

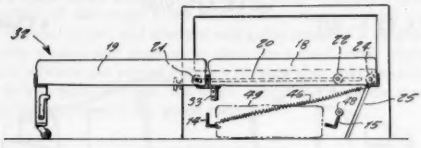
a washer mounted on the threaded member between the plumbing fixture and the flange, and frictional means carried by the washer and engaging the threaded member to prevent passage thereof through the flange opening except by rotation thereof, said washer being slidably movable with respect to the threaded member as it is being rotated about its longitudinal axis whereby the washer is operative to prevent separation of the lower nut from said first means; and

an upper nut so mounted on the upper end of the threaded member as to be operative to be rotated with the threaded member whereby said hold-down ring flange and the plumbing fixture are clamped together between said upper nut and said lower nut.

3,905,053
CONVERTIBLE BED SOFA

Mario Vuchelich, 130 Elliot Pl., Apt. 1F, Bronx, N.Y. 10454

Filed Aug. 5, 1974, Ser. No. 494,418
Int. Cl.[2] A47C *17/14*
U.S. Cl. 5—17 **3 Claims**

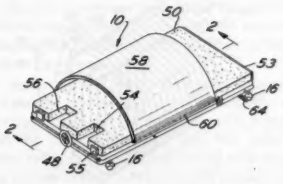


1. In a convertible bed sofa, the combination of a stationary frame comprised of opposite side walls and interconnecting front and rear angle iron bars, and a pair of bed frames supported thereupon, each said bed frame having a mattress thereupon, a first of said bed frames being adjustable to serve either as a back rest in a sofa position or as a rear bed member of a double bed when in a bed position, while a second of said bed frame is adjustable to serve as a seat in said sofa position or as a front bed member in said bed position, each said end wall including a horizontal groove and a slightly inclined vertical groove, said first frame having a first roller in said horizontal groove and a second roller in said vertical groove, while a rear portion of said second frame is supported on a roller carried in said horizontal groove, a forward end of said second frame being supported on a pair of front legs mounted on casters, a forwardly slidable bar in each said end wall intercepting at its rear end said vertical groove so to support said first frame roller carried in said vertical groove, when in said bed position, said bar having a knob upon a front end which abutts with a front edge of said side wall when said rear end intercepts said vertical groove and said first frame vertical groove roller rests thereupon, said bar rear end being tapered to a point and said bar being slidable inside a tubular sleeve extending from said side wall front edge to said vertical groove.

3,905,054
VEHICLE FOR PARALYZED PERSONS

Robert K. Windsor, 417 Spruce St., Philadelphia, Pa. 19106, and Ronald Windsor, 23 Michie Rd., Jefferson Farms, New Castle, Del. 19720

Filed Jan. 21, 1974, Ser. No. 435,357
Int. Cl.[2] A61G *1/02*
U.S. Cl. 5—81 **7 Claims**

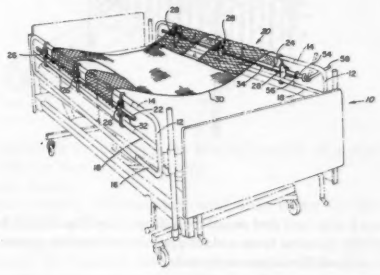


1. A low profile vehicle for supporting persons paralyzed from the waist down in a manner whereby the person may push the vehicle by contacting the floor with his hands comprising a frame having an upper frame section superimposed over a lower frame section, wheel means in the lower frame section, a mattress on the upper frame section for supporting a person in a face down position, means on the frame for selectively elevating the upper frame section at said mattress with respect to the lower frame section, discrete hinge means pivotably connecting each end of the upper frame section directly to a juxtaposed end of the lower frame section, means for selectively disabling each hinge means so that the upper frame section may be selectively pivoted to a forwardly inclined or a rearwardly inclined position with respect to the lower frame section, and a shield on the upper frame section for overlying the central portion of the mattress at spaced relationship thereto for protecting the lower back region of a person lying on the mattress.

3,905,055
PATIENT LIFT AND SUPPORT FOR HOSPITAL BED

Reed F. Blair, Bethel Park, Pa., assignor to Reed F. Blair, Incorporated, Pittsburgh, Pa.

Filed Aug. 9, 1974, Ser. No. 496,045
Int. Cl.[2] A47B *83/04*
U.S. Cl. 5—85 **6 Claims**



1. An auxiliary patient lift and support for a hospital bed having side guard rails extending upwardly above the height of the mattress comprising:

a. a first longitudinally extending frame member being non-rotatably and removably secured to a first one of said bed guard rails in a horizontal position by a first plurality of spring-loaded clamps fixed to said first frame member;

b. a second longitudinally extending frame member being rotatably and removably positioned upon a second one of said bed guard rails in a horizontal position by a second plurality of spring-loaded clamps rotatably receiving said second frame member and having a rotatable sleeve journaled thereon at one end to facilitate rotation of said second frame member within said clamps;

c. said first and second plurality of spring-loaded clamps each being formed with two hooks that are spring biased toward each other so that said clamps may be secured to said hospital bed guard rails by clamping horizontal members of said guard rails between said hooks;

d. a flexible patient support fabric fixed at opposite sides thereof to said first and second frame members;

e. rotating means to selectively rotate said second frame member relative to said bed guard rail to thereby stretch said patient support fabric taut between said first and second frame members and thereby lift a patient from the mattress of said hospital bed on said patient support fabric; said entire auxiliary patient lift and support being installable and removable from said hospital bed without any modification of said bed.

3,905,056
MIST-OXYGEN THERAPY CRIBLINER TENT

Jean F. Rosendahl, 6708 S.E. 39th Ave., Portland, Oreg. 97202

Continuation of Ser. No. 370,710, June 18, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,414
Int. Cl.[2] A47C *29/00;* **A47D** *7/00*
U.S. Cl. 5—97 **3 Claims**

1. In combination with a crib having a mattress, a support

for the mattress and frame means including a headboard, a footboard, a rear sideboard and a front sideboard,

the headboard and the footboard having spaced uprights, and a cribliner tent of integral, transparent material including a bottom panel positioned under the mattress and side panels and end panels each integral with the bottom panel and fastened to the upper end portions of the boards,

each side and end panel including a top flap folded back on the panel to form a sleeve portion extending around a top rail of the adjacent board,

the tent including fastening means securing the corner portions of the top flaps to adjacent portions of the panels,

the side panels including elongated side extensions woven into uprights of the headboard and the footboard and overlapping the end panels to form sealed corners.

3,905,057

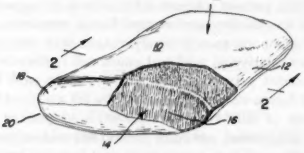
FIBER-FILLED PILLOW

Arnold L. Willis, Chicago, and Harold Wortman, Morton Grove, both of Ill., assignors to CWW Research and Development Company, Elkgrove Village, Ill.

Filed July 6, 1973, Ser. No. 377,073

Int. Cl. B32b *5/12;* **D04h** *1/00;* **B32b** *3/18;* **A47g** *9/00*

U.S. Cl. 5—337 **2 Claims**



1. A fiber-filled pillow comprising an air-penetrable pillow casing having an upper and a lower surface; an assemblage of generally co-planar fibers enclosed in said casing, said fibers having a length substantially less than the average thickness of the filled pillow, a majority of said fibers of said assemblage being substantially perpendicular to said surfaces and the fibers adjacent said surfaces being free thereof, whereby a majority of said fibers are parallel to the direction of a force applied by the user of said pillow.

3,905,058

BACK SUPPORTS

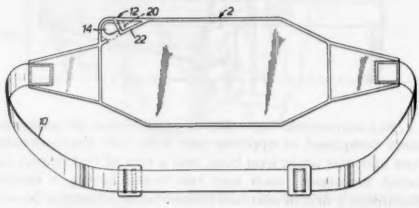
David Horsfield, Southam, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 13, 1973, Ser. No. 387,973

Claims priority, application United Kingdom, Aug. 11, 1972, 37469

Int. Cl. A47g *9/00*

U.S. Cl. 5—337 **6 Claims**



1. A support cushion comprising a bladder, an open-celled resilient filling material within the bladder, a resilient tube communicating with the interior of the bladder and a valve assembly for controlling the air flow through the passage, the valve assembly comprising a clamping device having opposed clamping members on opposite sides of the tube and including a fixed portion sealed to portions of the bladder and a movable portion positioned externally of the bladder and cooperating with the fixed portion to clamp together the walls of the passage whereby to close the resilient tube, said fixed portion comprising a threaded stud rigid with one of the clamping members and extending transversely through the tube, and the movable portion comprises a threaded knob mounted on the stud, the other clamping member being interposed between the knob and the tube.

3,905,059

METHOD FOR FLUID TREATMENT OF TEXTILE FABRIC IN ROPE FORM

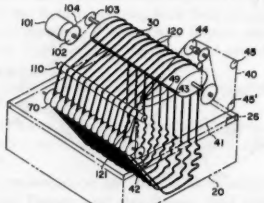
Edward Stanway, Prestbury, near Macclesfield, England, assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Division of Ser. No. 294,914, Oct. 4, 1972, Pat. No. 3,834,194.

This application Oct. 24, 1973, Ser. No. 409,047

Int. Cl.[2] D06B *3/24*

U.S. Cl. 8—151.1 **5 Claims**



1. A process for treating textile fabric in rope form by passing said fabric rope through a treatment liquid in a convoluted spiral path comprising the steps of engaging one end of said rope, winding said engaged end in an enclosed loop path about one end of a main roller and of a guide member to engage said rope upon the peripheral surface of said main roller and to within recess means of said guide member having convoluted coils wherein each full coil is formed with a semicircular portion and a semi-coil portion, rotating said main roller to impart a peripheral speed to the surface thereof

thereby to impart to said rope a winding motion, and rotating said guide member to guide said rope in a convoluted spiral path by engagement within said recess means, said winding of said engaged end being carried out by intermittently moving and stopping said end as it traverses a closed loop path wherein during the period when the end is moving, it is moved at a linear speed which is less than the peripheral speed of the surface of said main roller but greater than one-third said peripheral speed, and wherein said guide member is intermittently rotated and stopped to allow for lateral fabric expansion, wherein the period during which the said guide member is in a stopped position, the fabric rope is between the semicircular portions of the guide member.

3,905,060

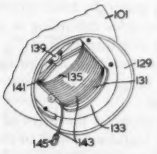
ANCHORING DEVICE FOR BUOYANT LIFE SAVING EQUIPMENT

William York Higgs, Gibsons, Canada, assignor to Intercontinental Marine Limited, Canada

Continuation of Ser. No. 280,418, Aug. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,312, June 18, 1970, Pat. No. 3,703,736. This application Apr. 30, 1974, Ser. No. 465,661

Int. Cl.[2] B63C *9/22*; **B63B** *21/52*

U.S. Cl. 9—9 **6 Claims**



1. An anchoring device for life boats or life rafts comprising:

a. a buoy;

b. a cable reel rotatably mounted on said buoy, the reel having end plates;

c. a cable of adequate strength to act as an anchor cable wound on said cable reel;

d. an attachment securing a first end of the cable to the reel;

e. a second attachment on the second end of the cable and adapted for attachment of this end of the cable to a ship which carries the buoy;

f. beacon means on the buoy adapted to be activated automatically upon release of the buoy from the ship;

g. supporting means on the buoy by which the buoy can normally be carried by said ship but permitting easy automatic release of the buoy should said ship sink;

h. braking means acting on the reel to cause paying out of the cable in a controlled manner as the ship sinks, said braking means comprising vanes carried by said end plates of the cable reel and constituting stiffening means for the end plates, said vanes engaging the water when the buoy is floating therein and thereby providing a retarding effect on the rotating cable reel; and

i. mooring means by which the life rafts or life boats can be moored to the buoy; whereby upon sinking of the shop the buoy is automatically released and remains on the surface of the water with said cable maintaining connection between the buoy and the ship, said buoy serving as both a beacon and a mooring point for said life rafts or life boats.

3,905,061

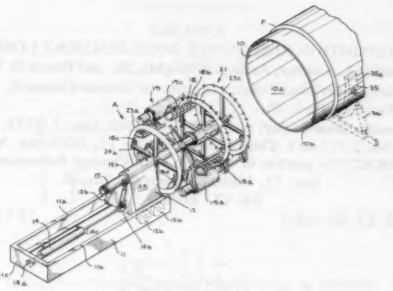
APPARATUS FOR FLAME-CLEANING PIPE

Robert R. Cradeur, Houston, Tex., assignor to Browning-Ferris Industries, Inc.

Filed July 29, 1974, Ser. No. 492,717

Int. Cl. B08b *9/02*

U.S. Cl. 15—4 **19 Claims**



1. Apparatus for cleaning the internal surface of a pipe or other tubular member, comprising:

a main frame;

carriage means mounted with said main frame for movement toward and away from a pipe end;

a rotating mandrel mounted for rotation on said carriage means for insertion into said pipe and oscillating means mounted with said carriage means for oscillating said mandrel through a cleaning cycle, said mandrel being rotated in a first direction in a first half of said cleaning cycle and in a second direction in the second half of said cleaning cycle;

torch means mounted on said mandrel for oscillation with said mandrel for burning a film or other coating off the internal surface of said pipe during said first half of said cleaning cycle; and

brush means mounted on said mandrel for removing any residue of said burned film or other coating during said second half of said cleaning cycle.

3,905,062

ARRANGEMENT FOR SECURING COATING STRIPS ON A WALL

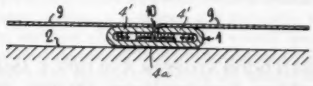
Jose Luis de Navas Albareda, Barcelone, Spain, assignor to Repla International S.A.H., Luxembourg, Luxembourg

Filed May 31, 1973, Ser. No. 365,640

Claims priority, application Switzerland, June 7, 1972, 8423/72

Int. Cl. A47g *27/04*

U.S. Cl. 16—4 **5 Claims**



1. An arrangement for securing adjacent edge portions of substantially co-planar cover strips in a juxtaposed manner and upon a wall comprising, a plurality of parallel elongated clamping assemblies each provided with a medial portion having a rear surface secured to the wall, said assemblies spaced apart from one another a distance corresponding substantially to the size of the strips to be laid between them, a front surface on said medial portion having first catching means projecting therefrom, each said assembly including a pair of auxiliary portions adapted to overlie said medial portion with the edge portions of an adjacent pair of said co-pla-

nar strips sandwiched therebetween and abutting one another, second catching means projecting from each said auxiliary portion and respectively engageable by said first catching means, and third catching means on each said auxiliary portion for attachment to the edge portions of the corresponding strips to secure said strips between said auxiliary portions and said medial portion.

3,905,063

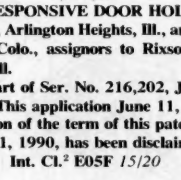
CONDITION RESPONSIVE DOOR HOLDER-CLOSER

Gordon L. Coulter, Arlington Heights, Ill., and Duane D. Pearsall, Morrison, Colo., assignors to Rixson-Firemark, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 216,202, Jan. 7, 1972, Pat. No. 3,777,423. This application June 11, 1973, Ser. No. 368,827The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.[2] E05F *15/20*

U.S. Cl. 16—48.5 **15 Claims**



1. A condition responsive electromechanical closure holder-closer for use with a closure adapted for relative movement with respect to a closure frame, comprising a housing containing the closure holder-closer and adapted to be surface mounted adjacent and above the closure, a spring located within the housing for exerting a closing force on the closure, a damper located within the housing and coupled to the spring for controlling the spring exerted closing force applied to the closure, an electromagnetic arresting means located within the housing with when energized arrests the spring-damper subcombination from closing an otherwise open closure relative the frame and which when deenergized enables the spring-damper subcombination to close the closure relative the frame, an arm assembly adapted to couple the closure to the closure holdercloser to provide closure control responsive to the energized or deenergized condition of the electromagnetic latch, a photoelectric condition-responsive detector contained within the housing and connected to the electromagnetic arresting means to control the energized or deenergized condition thereof, and means including passageways formed in said housing by which said internally housed detector is subjected to a fluid flow characteristic of the presence of said condition to deenergize an otherwise energized electromagnetic arresting means to thereby enable the holder-closer to release and close an otherwise open closure.

3,905,064

COMBINED DOOR STOPPER AND HINGE ASSEMBLY

Ernst Brockhaus, Remscheid-Hasten, Germany, assignor to Ed. Schärwachter KG, Remscheid, Germany

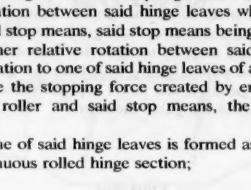
Filed Apr. 8, 1974, Ser. No. 459,212

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—145 **7 Claims**

1. In a combined door stopper and hinge assembly including a first and a second hinge leaf, a hinge pin pivotally interconnecting said hinge leaves for relative rotation about a hinge axis, a torsion spring having a body portion affixed to said first hinge leaf and a pair of bent ends forming spring arms, means connecting one of said spring arms with said first hinge leaf, a stop member formed upon said second hinge leaf, and a roller mounted upon the other of said spring arms in a position to operatively engage said stop member during pivotal movement of said hinge leaves relative to each other, said torsion spring being carried in said first hinge leaf in such a manner that said hinge leaves may be swung to turn freely relative to each other over a predetermined angle of rotation prior to engagement of said stop means by said roller, said torsion spring operating to create a spring force resisting further relative rotation between said hinge leaves when said roller engages said stop means, said stop means being configured to permit further relative rotation between said hinge leaves upon application to one of said hinge leaves of a force tending to overcome the stopping force created by engagement between said roller and said stop means, the improvement wherein:

at least one of said hinge leaves is formed as a segment of a continuous rolled hinge section;



said first hinge is formed with a stop surface having defined therein a longitudinal groove extending parallel to said hinge axis, said groove being defined between a pair of sides extending generally transversely to said stop surface with one of said sides extending at an angle of about 43° relative to said stop surface;

said body portion of said torsion spring is securely mounted upon said first hinge leaf to extend within said longitudinal groove; and

locking protuberances in the form of stamped portions of said first hinge leaf are formed in the stop surface of said first hinge leaf to extend transversely of said groove to partially overlap said torsion spring for locking said torsion spring in position within said groove to secure said torsion spring against movement in an axial direction relative to said first hinge leaf.

3,905,065

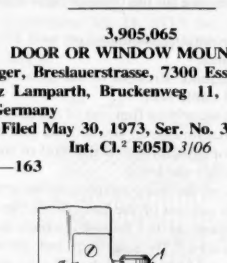
DOOR OR WINDOW MOUNTING

Walter Seeger, Breslauerstrasse, 7300 Esslingen am Neckar, and Fritz Lamparth, Bruckenweg 11, 7271 Egenhausen, both of Germany

Filed May 30, 1973, Ser. No. 365,082

Int. Cl.[2] E05D *3/06*

U.S. Cl. 16—163 **5 Claims**



1. In a door or window mounting including an upper movable hinge part supported on a lower fixed hinge part, a stationary hinge pin extending through coaxial, equal external diameter cylindrical portions of both hinge parts and a stop limiting opening movement of the door or window, the improvement comprising, in combination, a ring surrounding said stationary hinge pin and interposed between said upper

and lower ring parts, said ring having an external diameter equal to that of the external diameter of said cylindrical portions so as not to project radially outwardly beyond said cylindrical portions but, in effect, to form a smooth continuation of said cylindrical portions, interengageable means projecting from the lower surface of said ring and the upper surface of the cylindrical portion of said lower hinge part parallel to the respective axes thereof and within the respective peripheries thereof so as not to project radially therefrom, said interengageable means being operable to effect selective setting of the angular orientation of said ring relative to the cylindrical portion of said lower hinge part; and a stop element, extending upwardly from the upper surface of said ring and parallel to the axis thereof within the periphery thereof so as not to project radially therefrom and engageable with an abutment extending downwardly from the lower surface of the cylindrical portion of said upper hinge part parallel to the axis thereof and within the periphery thereof so as not to project radially therefrom, to constitute said stop.

3,905,066

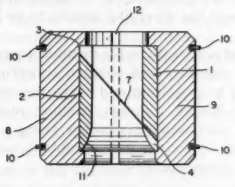
PROCESS AND APPARATUS FOR IMPROVING THE SHAPE OF A STICK OF LONGITUDINALLY SHIRRED ARTIFICIAL SAUSAGE CASING

Felix Rassbach; Rolf Buttner, and Stephan Schuck, all of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 213,031, Dec. 28, 1971, Pat. No. 3,798,301. This application Apr. 2, 1973, Ser. No. 346,879

Int. Cl.[2] A22C *11/02*

U.S. Cl. 17—42 **3 Claims**



1. Appaaratus for flattening and smoothing the round outer surface of a shirred and compressed stick of artificial sausage casing, which comprises a radially resilient smoothing sleeve means having a round passage therein, said sleeve means including two longitudinally slotted parts, the longitudinal slots of which are staggered relative to each other.

housing means divided in a plane passing through the center line of the round passage and enclosing the two parts of the smoothing sleeve,

and resilient means for holding the parts of the housing together.

3,905,067

APPARATUS FOR MAKING A NON-WOVEN WEB FROM SYNTHETIC FIBERS

Heinz Keib, Wertheim am Main, and Fredo Schlachter, Johannesberg, both of Germany, assignors to Glaswerk Schuller GmbH, Wertheim am Main, Germany

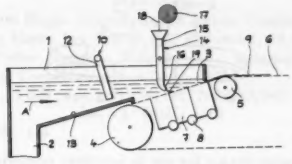
Filed Feb. 7, 1974, Ser. No. 440,469

Claims priority, application Germany, Feb. 8, 1973, 2306143

Int. Cl.[2] D04H *5/00*

U.S. Cl. 19—156 **11 Claims**

1. An apparatus for making a non-woven web from synthetic fibers, comprising a receptacle for accommodating an aqueous suspension of synthetic fibers, said receptacle having an inlet for said suspension and an outlet spaced from said inlet and through which said suspension flows in a path; a liquid-permeable forming wire extending beneath said outlet and being arranged to travel at an angle upwardly across the same, so that emerging suspension is intercepted by said forming wire and the liquid component runs off through the same while the fiber component forms a web thereon; and turbulence-creating means extending into said receptable and intersecting said path intermediate said inlet and said outlet to create turbulence in the suspension flowing towards the latter,



said turbulence-creating means comprising a plurality of members spaced along a line extending transverse to said path so as to form channels therebetween, and at least some of said members being formed with passages through which filamentary material can be discharged into said suspension so that such filamentary material becomes embedded in said web for reinforcing the same.

3,905,068

SHEET FILING DEVICE

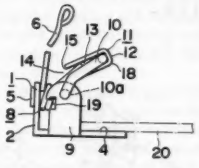
Ichiro Numazu, Hiratsuka; Yasuhiro Okutsu, Zama, and Matsutarou Aoki, Odawara, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1974, Ser. No. 515,713

Claims priority, application Japan, Oct. 27, 1973, 48-121115

Int. Cl.[2] B42F *1/00*

U.S. Cl. 24—67.5 **6 Claims**



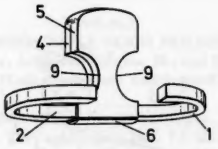
1. A sheet filing device comprising: a base plate having an uprising portion; a stationary pin provided perpendicularly to said uprising portion; a C-shaped rod swingably supported relative to said base plate and having a central linear part; a channel-shaped depressing member having upper and lower flanges and a web portion connecting the flanges, said linear part of the C-shaped rod passing between the flanges and along the inner side and in the vicinity of the web portion, the depressing member thereby being swingable around the linear part of the C-shaped rod; and spring means having an end thereof inserted into said depressing member and rotatably mounted on said pin, whereby when the spring means is rotated in a filing direction, said end of the spring means presses against the lower flange of the depressing member, while a portion thereof adjacent to the end of the spring means urges the upper flange upward, and the sheets are thereby pressed by an outer edge of the depressing member toward the base plate.

3,905,069

SECURING DEVICES FOR USE IN JEWELLERY

Zbigniew Janusz Szomanski, London, England, assignor to Zem of Wales Limited, London, England

Filed Aug. 5, 1974, Ser. No. 494,524
Int. Cl.[2] A44B *21/00, 13/00*
U.S. Cl. 24—73 HR 7 Claims



1. A securing device for use in jewellery comprising:

a body member including a C-shaped bar having a middle stroke portion and a pair of arcuate terminal portions with ends spaced apart to define an opening opposite said middle stroke portion;

a closure member including an elongated securement bar extending transversely from and pivotally connected to said middle stroke portion and having a free end portion swingable to and from a closed position in said opening coplanar with said C-shaped bar to define in at least one of said terminal portions a jewellery-engaging passage to which access is controlled by said securement bar; and

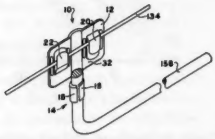
said securement bar including two plates embracing said middle stroke portion at least one of which is of resilient material and urged against the surface of a non-circular section on the middle stroke portion of said C-shaped bar when the securement bar is in closed position to thereby make said securement bar difficult to move from said closed position.

3,905,070

CONTROL CABLE CLIP

Ralph Macrae, Burlington, Canada, assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 4, 1974, Ser. No. 520,197
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—81 CR 11 Claims



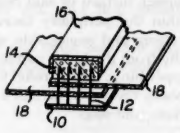
1. A one-piece clip for self-adjustably mounting the inner control wire of a control cable to a controlled device, said clip comprising a substantially flat body having a controlled device retaining means thereon, a pair of spaced apart, parallel elongated tabs formed in said body, said tabs being spaced from and extending generally parallel to one side of said body, each of said tabs having a smooth, curved surface extending towards said one side of said body, said one side of said body having at least one convolution formed therein presenting a convex surface extending generally parallel to and towards said tabs, said convex surface and said curved surfaces of said tabs being separated by a distance measured normally to said one side, which is less than the diameter of said control wire to be retained, said convex surface and said curved surfaces of said tabs providing a plurality of rounded, non-penetrating, opposed surfaces for retention of said control wire.

3,905,071

PRESS-THROUGH SELF-GRIPPING DEVICE

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., New York, N.Y.

Continuation of Ser. No. 126,709, March 22, 1971. This application Aug. 13, 1973, Ser. No. 387,977
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 7 Claims



1. Fastening device for piercing, penetrating or passing through one or more sheet-like articles to hold or fasten same comprising

a. a gripping member having (1) a base and (2) firmly secured thereto a multiplicity of upright, slim, individual, rigid and stiff needle-shaped gripping elements distributed on the base, said gripping elements having at least one barb at the end thereof which is furthest from said base, said gripping elements being mounted on the base in such a manner that they resist deflection which would otherwise prevent them from piercing, penetrating or passing through said sheet-like articles, said gripping elements being capable of piercing, penetrating and passing through the sheet-like articles to be held or fastened and

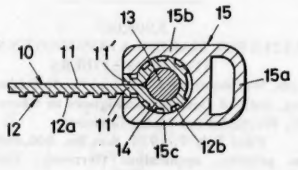
b. a soft and porous receiving member cooperating with said gripping member and adapted to permit said gripping elements to penetrate and lodge therein, said receiving member having a tough backing member laminated thereto, said backing member being a dense material which is substantially inpenetrable to said needle-shaped gripping elements.

3,905,072

SLIDING CLASP FASTENER

Akira Hasegawa, Kurobe; Yoshiharu Yamaguchi, Manerikawa, and Yoshio Matsuda, Nyuzenmachi, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,829
Claims priority, application Japan, Dec. 29, 1973, 49-4183[U]
Int. Cl.[2] A44B *19/34*
U.S. Cl. 24—205.16 R 2 Claims



1. A sliding clasp fastener comprising a pair of carrier tapes, each of said tapes having a flat face at one side and a waled face at the reverse side including a multiplicity of longitudinally extending alternate wales and grooves, series of discrete fastener elements mounted on said tapes, and a filler cord extending along one longitudinal edge of each of said tapes, said cord being wrapped around by the fabric of the tape with the peripheral surface of said cord intimately engaged with

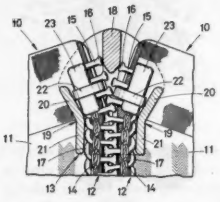
said flat face of the tape to form a bulged tape edge adapted for attachment of said fastener elements to the tape and thus with said waled face exposed around said cord.

3,905,073

TOP STOPS FOR SLIDE FASTENERS

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,828
Claims priority, application Japan, Dec. 29, 1973, 49-4186
Int. Cl. A44b *19/36*
U.S. Cl. 24—205.11 R **2 Claims**



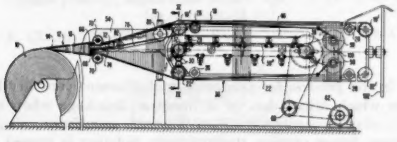
1. In a slide fastener of the type comprising a pair of stringers each having a tape with a continuous coupling element secured along one of its longitudinal edges opposed to the other stringer tape, said continuous coupling element having a series of transverse portions each with a coupling head at one end and a series of connective portions arranged remote from the coupling heads, and a slider slidable along said continuous coupling elements to open or close the slide fastener, the combination thereof with a pair of support members of plastic material overlying and substantially integrally uniting with several of said connective portions, including the uppermost ones, of said continuous coupling elements, respectively, and a pair of top stops each in the form of a strip of metal which are secured to said stringers by clamping engagement of said stringer tapes and said support members, respectively, to limit the movement of said slider along said continuous coupling elements in the fastener closing direction, each of said top stops being received between two adjacent transverse portions of the continuous coupling element.

3,905,074

METHOD AND APPARATUS FOR THE FINISHING TREATMENT OF YARNS

Heinrich Buddecke, Goppingen, Germany, assignor to Officine Savio S.p.A., Pordenone, Italy

Filed Oct. 31, 1973, Ser. No. 411,486
Claims priority, application Germany, Nov. 2, 1972, 2253713
Int. Cl.² D02J *1/18*
U.S. Cl. 28—1 R **20 Claims**



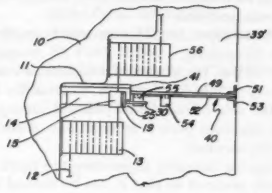
2. In an apparatus for unwinding a yarn which is wound in a continuous spiral with a flattened shape and which has on the inside thereof driven, finite conveyor support threads which extend in direction of the spiral axis and function as conveying members, spool means having wound thereon said continuous, flattened spiral of yarn with said supporting threads on the inside thereof, the improvement comprising a plurality of support members, an expanding member arranged inside said spiral and carried by said plurality of support members, said support members being arranged on both sides of said expanding member and outside of said spiral, coupling means, said support members gripping through said spiral on both sides alternately and intermittently and being coupled with said coupling means on said expanding member.

3,905,075

NOISE REDUCTION AND HEAT ZONE SEPARATION SYSTEM

Beryl Aaron Boggs, Chester; James Judson Cooksey, Colonial Heights; Harry Lee Newell, Jr., Richmond, all of Va., and John Walter Showers, Raleigh, N.C., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,905
Int. Cl.² D02G *1/16*
U.S. Cl. 28—1.4 **27 Claims**



1. In combination with a yarn draw panel of the type wherein advancing yarn is subjected to pressurized, superheated fluid flow utilizing a draw point localizing jet and is subsequently subjected to further treatment and/or is wound up, and wherein said draw point localizing jet has at least one yarn passage vertically therethrough with an adjacent access slot to facilitate string-up and has fluid conduits for admitting treating fluid into each of said yarn passage(s), said access slot being on the side of said draw point localizing jet farthest away from said draw panel, the improvement comprising:

A. noise reducing and heat directing means, said noise reducing and heat directing means comprising:

a. a mounting plate, said mounting plate having means for securing it to said draw point localizing jet;

b. a seal of heat resistant and noise absorbent material, the length of said seal being at least equal to the length of said access slot, said seal having one side which is shaped so as to close said access slot when brought into communication therewith;

c. a seal support plate, said seal support plate having two brackets at one end which extend in the plane of said seal support plate, the distance between said brackets being greater than the height of said mounting plate, said seal support plate having first pivot means thereon adapted for connection through one end of said mounting plate to both of said brackets and about which said seal support plate can pivot, the pivot of said seal support plate about said first pivot means in one direction causing said seal support plate to face the side of said draw point localizing jet having said access slot and in the other direction causing said seal support plate to clear access to draw point localizing jet, the side of said seal support plate facing said access slot when said seal support plate pivots about said first pivot means in that direction having a groove therein, said seal being secured in said groove so that the side which is shaped so as to close said access slot faces said access slot, said seal support plate having a lever extending from the side of said seal support opposite to that with said groove; and

d. spring urging means, said spring urging means comprising a spring guide, a pin, a shield, and a compression spring, said spring guide being located above the upper bracket of said seal support plate and being attached

thereto by second pivot means about which said seal support plate can pivot, the axis of said second pivot means being parallel to the axis of said first pivot means, said spring guide having secured thereto said pin the axis of which is transverse to the axis of said second pivot means, said shield having means for securing it to said mounting plate and having a downwardly extending lip, said lip having a slot therein which is significantly wider that said pin, the diameter of said compression spring being greater than that of said pin and greater than the height of said slot, said compression spring being located between said spring guide and said slot with said pin passing completely therethrough and into said slot, said shield covering said pin and said compression spring no matter what position they assume when said seal support plate pivots about said first and second pivot means, said spring urging means urging said seal support plate in a maximum pivot about its first and second pivot means when said lever is contacted; and

B. heat zone separating means, said heat zone separating means comprising:

a. two baffles, the planes of said baffles extending transversely to said yarn passage, said baffles being located on the side of said draw point localizing jet to which said mounting plate is secured, one of said baffles being fixedly secured;

b. means for slideably supporting the baffle which is not fixedly secured so that it can be moved in a direction transverse to said yarn passage; and

c. two fingers, said fingers extending in the same general direction from and having means for securing them to the baffle which is slideably supported, said fingers being of sufficient length and positioned such that said lever is located therebetween; whereby when the slideably supported baffle is pulled forward said seal is actuated to close and seal said access slot due to the spring urged pivot of said seal support plate in that direction resulting from contact of one of said fingers with said lever and functions to absorb some of the noise produced by said draw point localizing jet and to cause any unabsorbed noise as well as any heat produced to exit from the exit end of said draw localizing jet where said heat is confined downstream of the entrance of said draw point localizing jet by said baffles, and whereby said slideably supported baffle is pushed inward said seal is actuated to disengage from said access slot due to the spring urged pivot of said seal support plate in that direction resulting from contact of the other of said fingers with said lever and functions to clear access to the yarn heating system for safer string-up.

3,905,076

DRAWING APPARATUS

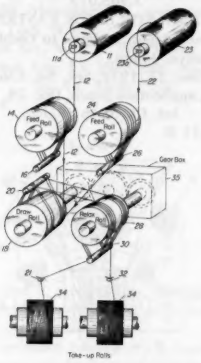
Dennis K. Harris, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 129,026, March 29, 1972, abandoned. This application Feb. 16, 1973, Ser. No. 333,253

Int. Cl.[2] D02J 1/22

U.S. Cl. 28—71.3 **6 Claims**

1. In a multiple yarn drawing apparatus comprising a plurality of adjacent draw frames of at least two rolls, said two rolls being a feed roll and a draw roll, said apparatus having means for separately feeding individual yarns to said feed rolls of the separate rdraw frames, said draw frames having means for directing said separately fed individual yarns to said draw rolls of said separate draw frames and having means for collecting the drawn yarns, the improvement comprising utilizing said rolls to effect a draw frame of n rolls $+x$ rolls, wherein n is an integer of from two to about four and represents the actual number of rolls in each draw frame and x is an integer having a value of from one to about four, said improvement providing means for directing at least two yarns, being fed to separate adjacent draw frames, from separate feed rolls to a single draw



roll, means for directing said separate yarns from said single draw roll to at least one other single draw roll located in a second draw frame.

3,905,077

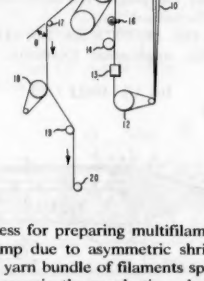
PROCESS FOR CRIMPING POLYESTER FILAMENT YARN

Hans R. E. Frankfort, Kinston, N.C., and Peter F. Lyons, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. Nos. 281,972, Aug. 18, 1972, and Ser. No. 353,808, April 23, 1973, Pat. No. 3,816,992, which is a continuation-in-part of Ser. No. 210,884, Dec. 22, 1971, abandoned. This application May 31, 1974, Ser. No. 476,129The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.

Int. Cl.[2] D02J 1/22; D02G 1/16

U.S. Cl. 28—72.17 **21 Claims**



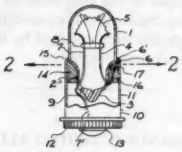
1. In the process for preparing multifilament yarn of filaments which crimp due to asymmetric shrinkage when relaxed, wherein a yarn bundle of filaments spun from a single synthetic linear organic thermoplastic polymer is passed in contact with a heated surface to provide asymmetric shrinkage properties on opposite sides of filaments, the improvement which comprises (a) drawing the filaments to provide the approximate break elongation desired in the product and (b) passing the drawn filaments at high speed in frictional contact with a durable, wear-resistant surface under frictional tension sufficient to generate all of the heat required to provide the desired asymmetric shrinkage properties without otherwise heating the wear-resistant surface.

3,905,078

METHOD OF MANUFACTURING MINIATURE LAMPS

John R. Anderson, Chesterland, Ohio, and Steve Boros, Memphis, Tenn., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 335,805, Feb. 26, 1973, Pat. No. 3,873,175. This application June 13, 1974, Ser. No. 478,859
Int. Cl.[2] H01J 9/18
U.S. Cl. 29—25.13 4 Claims



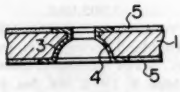
1. The method of electrically connecting the metal cylindrical shell having an inturned rim of a lamp base to be mounted on an end of a tubular shaped glass envelope of an electric lamp to an outer wire lead extending outwardly from the said envelope end and between the wall of the envelope and the rim of the metal shell of the base in its mounted position on the envelope end, which method comprises the steps of flattening at least that section of said outer wire lead which, in the final mounted position of the base on the said envelope end, will extend and intervene between the envelope wall and the rim of the base shell, the said flattening of said wire lead section being in a plane such that when the flattened section is in its said intervening position extending between the envelope wall and the rim of the base shell, it will lie in a plane approximately tangent to the envelope wall, applying a coating of an electrically-conducting basing cement utilizing a heat curable organic polymer binder having a finely devided conductive solid dispersed therein to the flattened wire lead section, positioning the lamp base in its said mounting position over the said end of the envelope with the said flattened wire lead section extending and wedged between the wall of said envelope and the rim of the metal shell of said base, and then heating the rim of the base shell and the said flattened wire lead section wedged between the base shell rim and the envelope wall to heat-cure the cement coating and adhesively bond said wire lead section to the base shell.

3,905,079

METHOD OF MANUFACTURING COLOR SELECTIVE ELECTRODE FOR COLOR PICTURE TUBE OF BLACK MATRIX TYPE OR THE LIKE TYPE

Hiromi Kanai; Kiyoshi Watanabe, both of Mobara, and Eiichi Yamazaki, Ichihara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 25, 1974, Ser. No. 436,723
Claims priority, application Japan, Apr. 13, 1973, 48-41397
Int. Cl.[2] H01J 9/14
U.S. Cl. 29—25.17 6 Claims



1. A method for manufacturing a color selective electrode for a color picture tube of the type having a phosphor screen provided with a plurality of phosphor units the dimensions of which are smaller than those of openings in the color selective electrode, comprising:

forming a number of apertures in an electrode plate by an etching treatment, said electrode plate having two main surfaces communicating with each other through said apertures, said apertures being smaller in dimensions than said openings;

covering the walls of said apertures and at least portions of said main surfaces with an auxiliary film to define predetermined dimensions for said openings;

covering the remaining portions of said main surfaces of said plate with a secondary electron emission suppressing material; and

removing said auxiliary film and re-etching the resulting electrode plate to enlarge said apertures by an etchant thereby forming said openings in said electrode plate, said secondary electron emission suppressing material being resistive to the etchant used in said re-etching step,

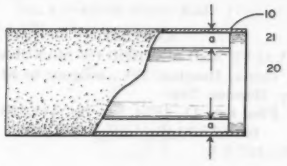
said phosphor screen being produced by steps including photographic exposure through said apertures prior to said re-etching step.

3,905,080

ABRADING DEVICES

Herbert M. Bond, Stillwater, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Division of Ser. No. 237,734, March 24, 1972. This application Feb. 4, 1974, Ser. No. 439,295
Int. Cl.[2] B23D 67/08
U.S. Cl. 29—76 R 4 Claims



1. An abrading apparatus including a member for supporting a rotatable mandrel, a mandrel rotatably mounted on said member, means for rotating said mandrel, said mandrel operable for receiving an abrading drum of diameter D_1, said mandrel having diameter D_2 which is less than said diameter D_1 to thereby provide clearance between said abrading drum and said mandrel to thereby allow said abrading drum to flex radially inward in response to a radial inward force on said abrading drum, said abrading drum having an elastomer surface located on the ends of said abrading drum that is sufficiently soft to expand radially outward under centrifugal force to thereby frictionally engage the inside of said abrading drum and an air gap between said ends of said abrasive drum that is sufficiently large so as to allow radial inward flexing of said drum in response to a radial inward force to said drum without producing engagement of said abrading drum with said elastomer surface on said abrading drum.

3,905,081

TOOL HOLDER

Sven Axel Olof Wirfelt, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed May 29, 1974, Ser. No. 474,187
Claims priority, application Sweden, June 5, 1973, 7307874
Int. Cl.[2] B26D 1/00
U.S. Cl. 29—96 2 Claims

1. Toolholder for a clamped insert, said toolholder having an insert site, from a bottom surface of which there projects a pin;

an insert having a pin-receiving bore;

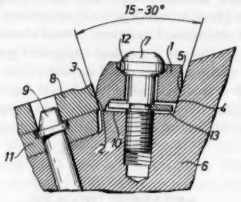
said insert being positioned on said pin;

a clamping element positioned for wedging engagement between a wedging surface in the toolholder facing said

pin and an opposite edge surface of said insert on said pin; and

an actuating device to urge the clamping element towards an abutment surface in the holder between said wedging surface and the pin,

said clamping element having two projections in spaced relation, one said projection being a clamping surface acting on said edge surface of the insert, the other said



projection being a support surface acting slidably on said abutment surface in the holder between the actuating device and the insert, so that said clamping element is performing a small rotation movement upon the tensioning of said actuating device whereby a slight rotational movement is imparted to the insert in a direction to hold its leading end firmly against its bottom surface in said site.

3,905,082

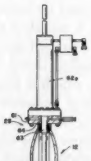
GATE VALVE AND METHOD OF MANUFACTURE

Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Feb. 11, 1974, Ser. No. 441,328

Int. Cl.[2] **B23P** *15/00;* **F16K** *3/00*

U.S. Cl. 29—157.1 R **4 Claims**



1. A method of manufacturing body extensions for gate valves of the type comprising a body formed in two parts, namely, a main body part and an upper body extension, the main body part having end walls provided with openings forming aligned flow passages, the body extension having a lower extremity secured to the upper end portion of the main body part, the upper extremity of the body extension being closed by a plate adapted to mount a bonnet assembly, the method comprising forming a box-like structure made of flat steel walls, the structure including end walls that are rectangular in configuration and secured by weld metal along their longitudinal edges to longitudinal edges of side walls that are rectangular in configuration and of a thickness and bending strength less than the end walls, securing flat closure walls to the extremities of the structure by welding, applying clamping means across the end walls of the structure along an area intermediate the ends of the structure whereby the end walls are restrained from being deflected outwardly by internal pressure within the area engaged by said clamping means, applying hydraulic pressure to the interior of the structure to cause outward bulging of the end walls between the clamping means and the extremities of the structure and also to cause inward transverse and longitudinal arching of the side walls without substantial deformation of the weld metal that secures the longitudinal edges of the end walls to the side walls, removing the clamping means and then severing the structure on a plane intermediate the area engaged by the clamping members to form two body extensions.

3,905,083

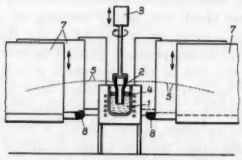
PROCESS OF MANUFACTURING ALUMINUM-LEAD BEARING MATERIAL

Hans Betz, Dantestrasse 5, 62-Wiesbaden; Dietrich Merz, Fischbacher Str. 24, 6233-Kelkheim; Heinrich Winter, Kurt-Schumacher, Str. 4, 6236 Eschborn, and Hans Ahlborn, Hausdeich 141, 2053 Hamburg, all of Germany

Filed Jan. 23, 1974, Ser. No. 435,868

Int. Cl.[2] **B21D** *53/10;* **B22D** *23/00*

U.S. Cl. 29—149.5 S **7 Claims**



1. A process for the manufacture of aluminum-lead materials having in the range of about 3–26 percent by weight of lead wherein the lead exists in the form of a fine precipitate evenly distributed in the aluminum matrix, said process comprising the steps of: melting together aluminum and lead in the desired proportions in said range; heating said melt to a mixing temperature above the miscibility gap of aluminum and lead; covering said overheated melt by a protective layer to prevent lead losses due to evaporation and prevent hydrogen embrittlement; extracting said overheated melt from melt regions below said protection layer and directly centrifugally casting-off said melt to produce droplets; and solidifying the so-produced melt droplets into granules very rapidly so as to substantially freeze the state of the overheated melt present above the said miscibility gap.

3,905,084

WEDGE COMPRESSOR

James E. Mayer, Highland Springs, Va., assignor to The D. S. Brown Company, North Baltimore, Ohio

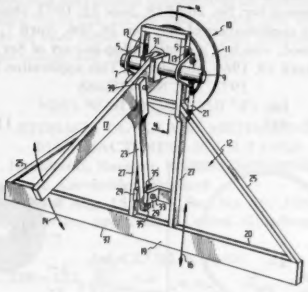
Filed Mar. 8, 1974, Ser. No. 449,507

Int. Cl.[2] **B25B** *27/02*

U.S. Cl. 29—267 **9 Claims**

7. A glazing wedge compressor, comprising a suction operated window surface adhering member, a glazing wedge contacting member having a wedge contacting face thereon, and means operably connected to the surface adhering member for engaging and pushing the glazing wedge contacting member in a direction parallel to the window surface and away

from the adhering member against a glazing wedge to drive the wedge into a desired position at the periphery of the window surface; and wherein said wedge contacting face faces in the direction of wedge contacting member movement.



3,905,085

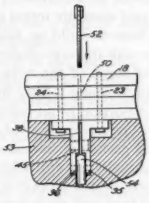
METHOD OF SECURING A FRONT HINGE TO AN EYEGLASS FRAME FRONT

Harold F. Whiting, Attleboro, and Herbert P. Nelson, North Attleboro, both of Mass., assignors to The Hilsinger Corporation, Plainville, Mass.

Division of Ser. No. 375,385, July 2, 1973, which is a continuation-in-part of Ser. No. 171,679, Aug. 13, 1971, abandoned. This application May 14, 1974, Ser. No. 469,818

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—418 **2 Claims**



1. The method of securing a front hinge to an eyeglass frame front comprising:

a. forming a front hinge having a base and at least an integral pair of spaced barrels extending upwardly therefrom defining a slot therebetween,

b. securing the front hinge base to the temple end portion of an eyeglass frame whose rim is molded in a closed loop,

c. aligning the center of the slot between the barrels with a cutting means,

d. and then cutting a slit completely through the wall of the vertical section of the rim in line with the slot between the spaced barrels and then through the base of the front hinge.

3,905,086

METHOD OF CONSTRUCTING AXLE HOUSING ASSEMBLY

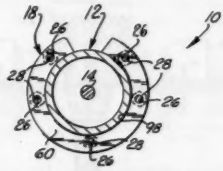
Joseph F. Tetlak, Lyndhurst, Ohio, assignor to Willow Hill Industries, Inc., Willoughby, Ohio

Filed Jan. 28, 1974, Ser. No. 437,196

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—428 **11 Claims**

1. A method of constructing an axle housing assembly having a collar for use in connecting a portion of a brake assembly with an axle housing, said method comprising the steps of providing an axle housing having a portion with which the brake assembly is to be connected, forming the collar, and connecting the collar to the axle housing, said step of forming the collar including the steps of providing a piece of metallic bar stock having a generally circular cross sectional configuration, bending the piece of bar stock to a configuration in



which it at least partially encloses an area having a configuration generally similar to the cross sectional configuration of the portion of the the axle housing to which the collar is to be connected, and thereafter forming the piece of bar stock so that it has a noncircular cross sectional configuration.

3,905,087

METHOD OF MAKING A FITTED KIT

Dorothy Leahy, 5 Pinehurst Ave., New York, N.Y. 10033

Division of Ser. No. 304,607, Nov. 8, 1972, Pat. No. 3,831,651. This application May 8, 1974, Ser. No. 468,287

Int. Cl.[2] B21D *39/03;* **B23P** *11/00*

U.S. Cl. 29—428 **1 Claim**

1. A method of making a fitted kit suitable for use in the manner of a handbag comprising handknitting or crocheting a first rectangular member, folding over each of two opposite sides of the first member onto the same side thereof so that the folded over portions are in laterally spaced relationship to one another, attaching the folded over portions to the remainder of the first member at spaced locations forming pockets therebetween for holding small items, attaching a second rectangular member to the side of said first member opposite said folded over portions, attaching fastening members to said second member, folding the first and second members with the folded over portions over upon itself into a handbag-like kit with the folded over portions located inwardly and securing the members in the folded position by means of the fastening members.

3,905,088

METHOD OF ATTACHING MESH WEBBING TO A LACROSSE STICK

Richard B. C. Tucker, and William C. Crawford, both of Baltimore, Md., assignors to Wm. T. Burnett & Co., Incorporated, Baltimore, Md.

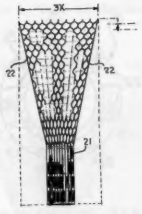
Division of Ser. No. 421,357, Dec. 3, 1973, Pat. No. 3,822,062. This application Apr. 24, 1974, Ser. No. 463,548

Int. Cl. B23p *19/04*

U.S. Cl. 29—433 **4 Claims**

1. A method of providing a web for a head of a lacrosse stick, said method comprising the steps of providing knitted mesh of uniform width, rearranging said mesh to include one end portion substantially free of expansion and the other end

portion being widely transversely expanded to fill the head, with the expansion of the web gradually decreasing from said



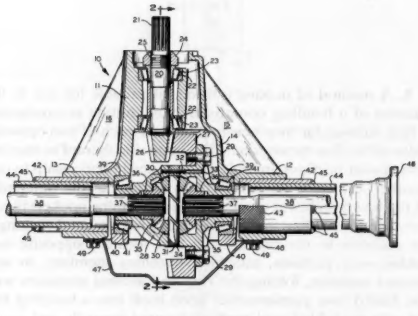
other end portion into said portion substantially free of expansion, and lacing said partially expanded mesh into the head.

3,905,089

METHOD OF CONSTRUCTING A ONE-PIECE ALUMINUM DIFFERENTIAL HOUSING

Carl D. Osenbaugh, Fort Wayne, and Ronald E. Bollet, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 22, 1974, Ser. No. 445,009
Int. Cl.[2] F16H *57/02*; **B60B** *35/16*
U.S. Cl. 29—434 **2 Claims**



1. A method of constructing an axle including a differential said method comprising:

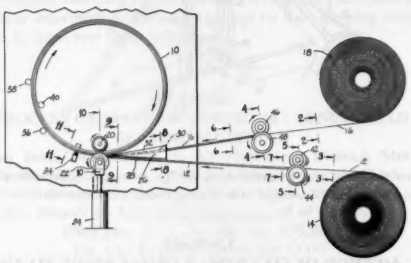
a. providing a pair of axially aligned sleeves;
b. casting an one-piece differential housing of aluminum or the like about said sleeves;
c. inserting a cutting tool through said sleeves and machining bearing seats in said housing adjacent to said sleeves;
d. placing a tube in mating and axially overlapping relationship with each of said sleeves and securing said tubes of the associated one of said sleeves and installing differential gearing within said housing, said gearing including bearings mating with the seats machined in step c; and
e. inserting axle shafts through said tubes and sleeves and into driving engagement with said differential gearing.

3,905,090

METHOD OF MAKING SPIRAL WOUND GASKETS

John B. Painter, Flemington, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 266,518, June 22, 1972, abandoned, which is a continuation of Ser. No. 26,306, April 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 815,166, April 10, 1969, abandoned. This application Nov. 23, 1973, Ser. No. 418,488
Int. Cl.[2] B21D *39/00*; **B23P** *19/04*
U.S. Cl. 29—455 **11 Claims**



1. The process of making a spirally wound axially compressible annular gasket of the type adapted to be pressure sandwiched between generally axially aligned surfaces to be sealed comprising:

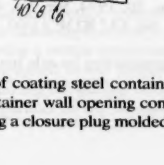
a. bending and guiding an elongate metal strip to convolute an end portion of the elongate metal strip upon itself to define a closed free loop configuration of predetermined circumference encompassing an open air core, and fixedly securing the elongate metal strip in the closed free loop configuration of predetermined circumference;
b. spirally winding said elongate metal strip and a filler strip upon the closed loop to build up further convolutions in a radial direction with the convolutions of said filler strip separating at least some of the adjacent convolutions of the metal strip for defining a filler therebetween,
c. fixedly securing a portion of an outer convolution of the metal strip to an underlying convolution thereof for securing the formed gasket in assembed relation, and
d. supporting substantially the entire length of the side edge of the convolutions upon a support surface during formation of the closed loop and the subsequent spiral winding of said elongate metal strip and said filler strip upon the closed loop.

3,905,091

METHOD OF PROCESSING CONTAINERS

John W. La Rocque, Harrison, N.Y., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 318,926, Dec. 27, 1972, abandoned. This application Aug. 7, 1974, Ser. No. 495,338
Int. Cl.[2] B23P *3/00*, *19/04*
U.S. Cl. 29—460 **5 Claims**



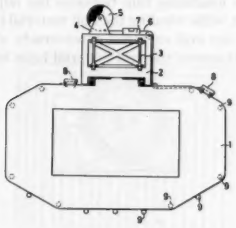
5. The method of coating steel containers having an internally threaded container wall opening comprising the steps of threadedly engaging a closure plug molded of synthetic plastic

material within said container wall opening, seating said plug within said opening with sufficient torque to prevent loosening of said plug from vibration while permitting said container to vent past said plug, applying a coating to said container exterior, subjecting said coated container to an elevated temperature curing cycle for curing said coating and allowing said container to cool down for handling and shipment with said plug maintaining said thread engagement.

3,905,092
STORAGE TANKS AND METHODS OF MANUFACTURING SUCH TANKS

Peter T. Houldcroft, Royston, England, assignor to The Welding Institute, Cambridge, England

Filed Aug. 15, 1974, Ser. No. 497,710
Claims priority, application United Kingdom, Aug. 15, 1972, 38532/72
Int. Cl.[2] B23K *11/06*
U.S. Cl. 228—173 **15 Claims**



1. A method of forming a membrane tank including the steps of:

positioning a stand for a reel of strip material close to the required tank location;

fixing the outer end of the reel strip to a traction device;

guiding the traction device around a track defining the required tank perimeter and guiding the strip of material pulled from the reel by the device over a frame such that the pulled strip forms the perimeter wall of a section of the tank:

subsequently guiding the traction device so as to pull a further length of strip material from the reel over a frame section such that the further length of strip material is laid at the side of the previously laid strip to form the perimeter wall of the next section of the tank;

after a strip has been laid alongside a previously pulled strip, moving a seaming device around the frame to weld the edge of the newly pulled strip to the previously pulled strip;

and continuing to pull further strips of material and to weld each to the side of the last pulled strip until the total width of the side-by-side strips is equal to the required tank dimension in this direction.

3,905,093
METHOD OF ERECTING WALL-FORM

Chester I. Williams, 347 Greenbriar, S.E., Grand Rapids, Mich. 49508

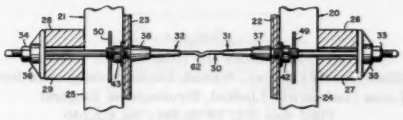
Division of Ser. No. 59,466, July 30, 1970, abandoned. This application Jan. 18, 1973, Ser. No. 324,599
Int. Cl. B23p *19/00*
U.S. Cl. 29—526 **1 Claim**

1. A method of erecting a wall-form panel assembly of the type having a pair of form panels, external bracing for said panels, tie rod assemblies extending transversely across said panels and interconnecting said bracing, and a pair of tubular cone members associated with each tie rod assembly, adapted to be secured to said panels and extend therethrough, said tie rod assemblies being slidably received in said cone members, comprising the steps of:

a. positioning said panels in spaced parallel relation to one another to define opposite faces of a wall;

b. securing said tubular cone members to said panels;

c. inserting said tie rod assemblies through said panels and said tubular cone members;



d. fixedly securing said tie rod assemblies to said cone members to prevent relative movement of said panels and said tie rod assemblies;

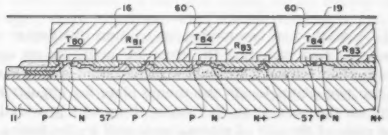
e. erecting said external bracing on said panels; and

f. subsequently securing the ends of said tie rod assemblies to said bracing in force transmitting relation thereto.

3,905,094
THERMAL DISPLAY MODULE

Edward M. Ruggiero, Dallas, Tex., assignor to Displaytek Corporation, Dallas, Tex.

Continuation of Ser. No. 216,537, Jan. 10, 1972, abandoned, which is a division of Ser. No. 79,505, Oct. 9, 1970, Pat. No. 3,700,852. This application Oct. 15, 1973, Ser. No. 406,365
Int. Cl. B01j *17/00*
U.S. Cl. 29—577 **5 Claims**



1. A method of fabricating a thermal printing device of the type including a first array of heat dissipative elements, selected ones of which, when energized, define a form of information representation and a second group of circuit components for respectively energizing said heat dissipative elements, said method comprising:

a. forming said first array of heat dissipative elements within a first confined area, and at one major face, of a body of semiconductor material and said second group of circuit components within a second area, and at the same major face, of the same said body of semiconductor material so that said second area is spaced from, but at least partially surrounds, said first confined area;

b. selectively forming thin film conductive means at said one major face to provide an electrical interconnection pattern between selected ones of said heat dissipative elements and selected ones of said second group of circuit components, said electrical interconnection pattern being of a first defined thickness,

c. forming conductive bonding pad portions of a thickness substantially greater than said first defined thickness, said conductive bonding pad portions being formed over said thin film conductive means solely at locations at the outer periphery of said second area,

d. mounting said semiconductor body to a supporting insulating substrate having a metallization pattern disposed thereon so that said thin film conductive means at said one major face is adjacent to, but raised and separated from, said supporting substrate with said conductive bonding pad portions in physical contact with end portions of said metallization pattern, said substantially

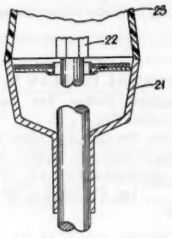
thicker bonding pad portions thereby providing the sole support for said semiconductor body; and

e. selectively removing semiconductor material from the other major face of said semiconductor body within said first confined area as well as between said first confined area and said second area, thereby to substantially thermally isolate said heat dissipative elements from one another as well as from said second group of circuit components along said other major face.

3,905,095
IGNITION DISTRIBUTORS

William Harold Cooksey, Walsall, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 12, 1970, Ser. No. 63,246
Claims priority, application United Kingdom, Dec. 24, 1969, 62777/69
Int. Cl. H02I *15/02*
U.S. Cl. 29—598 **4 Claims**

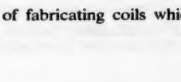


1. A method of assembling an ignition distributor of the kind specified including the steps of: engaging an annular timing plate with an annular base plate so that mating surfaces on the two plates locate the timing plate for angular movement on the base plate; deforming three ears provided on a first plate of the pair of plates constituted by the timing plate and the base plate, towards the surface of the second plate remote from the first plate, said ears being provided on the first plate in such a manner that any one of the ears is on the opposite side of a diameter of the first plate from the remaining ears; and moving the first plate angularly relative to the second plate so that three ramps upstanding from the seond plate engage the ears respectively and deform the ears away from said surface of the second plate, so that a predetermined clearance substantially equal to the heights of the highest parts of the ramps above said surface of the second plate, exists between the second plate, said predetermined clearance thereby rendering the first and second plates capable of relative axial movement through a predetermined distance.

3,905,096
METHOD OF FABRICATING COILS

Junro Tawara, Fussa, and Masanori Ohhashi, Ichikawa, both of Japan, assignors to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1974, Ser. No. 453,687
Claims priority, application Japan, May 4, 1973, 48-50117
Int. Cl.² H01F *7/06*
U.S. Cl. 29—605 **1 Claim**



1. The method of fabricating coils which comprises the steps of:

a. making a coil material by affixing a conductor foil on an insulating film;

b. inserting the coil material between an upper cutting member and a lower cutting member of a cutting section, in which the upper cutting member is provided with a plurality of cutting rings spaced apart from each other and provided with spacer rings therebetween, each of the spacer rings having a slightly smaller diameter than that of the cutting rings and a width equal to the thickness of a coil to be fabricated, and the lower cutting member is fixedly mounted on a lower shaft and has a periphery in the form of a spiral gear and a width equal to the sum of the widths of the cutting rings and the spacer rings of the upper cutting member;

c. rotating the lower shaft by a driving motor;

d. maintaining the distance between the upper cutting member and the lower cutting member equal to the thickness of the insulating film during rotation of the lower shaft;

e. shaving off longitudinally the conductor foil by action of the cutting rings, thereby forming a plurality of parallel conductors on said insulating film;

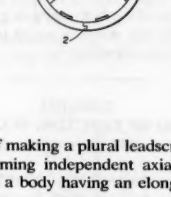
f. cutting the insulating film between the adjacent parallel conductors while winding the coil material into a coil; and

g. cutting the coil material transversely after a desired number of turns of the coil material have been wound on the coil.

3,905,097
METHOD OF MAKING PLURAL POTENTIOMETER BODY

Arthur B. Beetle, St. Petersburg, Fla., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 408,097, Oct. 19, 1973, Pat. No. 3,846,733. This application July 11, 1974, Ser. No. 487,610
Int. Cl.² H01C *17/06*
U.S. Cl. 29—620 **6 Claims**



1. The process of making a plural leadscrew potentiometer body including forming independent axial vitreous enamel resistance strips on a body having an elongated internal surface comprising;

applying a vitreous enamel resistance mixture to the internal surface;

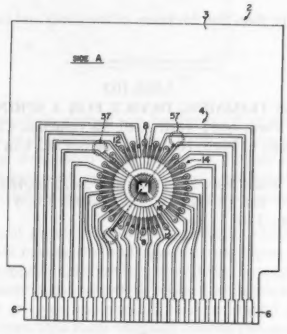
curing the mixture to form a vitreous enamel resistance glaze material, selectively removing areas of the resistance material in axial strips parallel to the elongated dimension of the external surface thereby leaving bare strips between the remaining independent strips of the resistance material.

3,905,098

MICROELECTRONIC TEST PROBE CARD INCLUDING A MULTIPLICITY OF PROBE CONTACTS AND METHOD OF MAKING SAME

Oliver R. Garretson, and Richard C. Harmon, both of Mountain View, Calif., assignors to Xynetics, Inc., Santa Clara, Calif.

Division of Ser. No. 386,999, Aug. 9, 1973, Pat. No. 3,835,381, which is a continuation of Ser. No. 799,472, Feb. 14, 1969, abandoned. This application Mar. 28, 1974, Ser. No. 455,599
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—628 7 Claims



1. A method of producing an electrically conductive probe assembly for testing a substrate having a plurality of terminals, providing a support member having a support surface with a tapered configuration and having a central aperture,

providing positioning means with a plurality of apertures corresponding to the positions at which the tips of a plurality of electrically conductive probes are to be disposed in the central aperture of the support member,

providing a printed circuit board with an aperture positioned at an intermediate position on the board and with a plurality of printed circuit leads disposed in spaced relationship to one another on the board and with the printed circuit leads extending at one end to a position adjacent to the aperture and at the other end to a position adjacent to at least one edge of the board,

disposing a plurality of electrically conductive probes on the tapered support surface of the support member in spaced relationship to one another and with the tips of the probes extending through the apertures in the positioning means and with the opposite ends of the probes adjacent individual ones of the printed circuit leads,

electrically connecting the probes to the associated ones of the printed circuit leads on the printed circuit board,

providing a base having a support surface with a central aperture and with a tapered configuration substantially mating with the tapered surface on the support member,

adhering the tapered support surface on the base to the conductive probes such that the electrically conductive probes have positions on the support surface of the base corresponding to the positions on the support surface on the support member, and

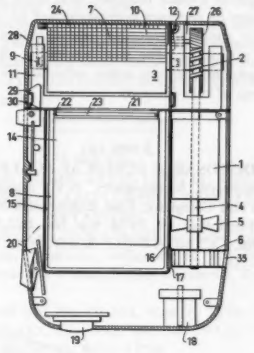
removing the support member from the probes after adhering the tapered support surface on the base to the probes.

3,905,099

ELECTRICAL RAZOR

Elon C. Bernström, 82, Karlbergsvagen, S-113 35 Stockholm, Sweden

Filed Mar. 4, 1974, Ser. No. 447,343
Claims priority, application Sweden, Mar. 2, 1973, 7302959
Int. Cl.[2] B26B *19/44*
U.S. Cl. 30—41.5 5 Claims



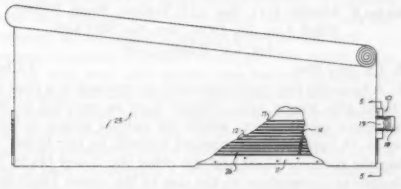
1. A razor device including an electrical drive motor, which through a transmission drives a cutting arrangement comprising an apertured cutting blade, adjacent one innerside of which there is provided a movable cutting means having cutting edges, there being provided means defining a closed cavity having an outlet opening and an inlet opening, said cutting arrangement being adjacent to said inlet opening, around which there is provided an air-permeable hair collecting bag in the cavity, a first and a second fan means being arranged on and driven by a shaft of said motor, said first fan means producing a first axial air stream over the motor and the transmission to the cutting arrangement, said second fan means being a radial turbine blower, having an inlet opening which is connected to said cavity outlet opening, said second fan means producing by suction a second air stream from said cutting arrangement through the cavity inlet opening, which second air stream comprises the air of said first air stream and air which is sucked through the apertures of the cutting blade.

3,905,100

CARPET CUTTER GUIDE

Richard E. Kleine, 46 N. Mickley, Apt. C., and Thomas W. Killion, 6550 Doris Dr., both of Indianapolis, Ind. 46224

Filed June 6, 1974, Ser. No. 477,041
Int. Cl.[2] B26B *3/08*
U.S. Cl. 30—124 7 Claims

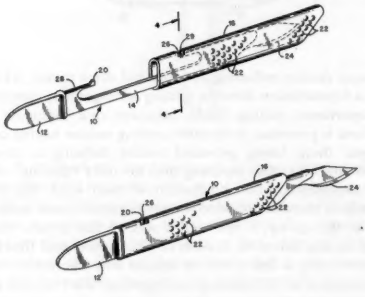


1. Apparatus for guiding a carpet cutter along the width of a sheet of carpeting comprising:

a. a base support structure sized appropriately to permit the entire width of a roll of carpeting to be flattened into a sheet;

b. a plurality of evenly spaced grooves in said base support structure, said grooves being sized appropriately for receiving the guide member of a carpet cutter;
c. a surface structure fixedly attached to said base support structure defining openings into said grooves, said openings into said grooves being narrower in width than said grooves; and
d. a carpet cutter holder, said holder being mounted on rotating means, said rotating means being movable along the length of a track member, said track member having a plurality of recesses corresponding to each groove in said base support structure, said recesses indicating the proper positioning for said holder to allow said guide means attached to said cutter mounted on said holder to enter one of said grooves.

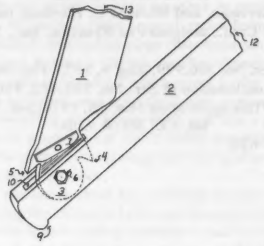
3,905,101
DISPOSABLE SURGICAL SCALPEL
John W. Shepherd, Montgomery, N.Y., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Apr. 19, 1974, Ser. No. 462,319
Int. Cl.[2] A61B *17/32;* **B26B** *1/08, 5/00*
U.S. Cl. 30—162 **3 Claims**



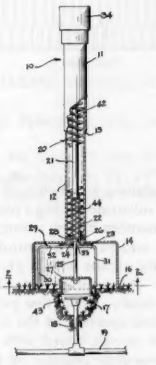
1. A unitary, disposable surgical scalpel which comprises,
a frangible handle;
a cutting blade attached to said handle;
a sheath movably attached to said handle;
means for releasably locking said sheath in a first position sheathing said blade; and
means for releasably locking said sheath in a second position exposing the blade.

3,905,102
SHEET METAL CUTTER
Charles F. Morris, P.O. Box 223, Tenino, Wash. 98589
Filed Aug. 26, 1974, Ser. No. 500,349
Int. Cl.[2] B26B *13/08*
U.S. Cl. 30—194 **3 Claims**

1. A basically two hand operated, as opposed to a plier type or hand grip trigger type, chipper type as opposed to shear type, sheet metal cutter, which for cutting action is simple levered, as opposed to compound levered, by two levers, one being the receiver blade and the other the cutter blade, long in length in comparison to the size of the cutter blade head, which is shaped basically round, pivoted at the center of the round; with two sawtooth shaped chisel pointed type teeth pointed in opposite directions and extended outward from the perimeter of this basic round, and spaced with their teeth points approximately a half circle distance apart; the teeth points being sharp but flat and the teeth slightly wider, thicker, than that portion of the blade head which passes thru the cut in the sheet metal, the part of the cutter blade passing thru the cut being machined or ground to be more thin, or more narrow in width than the thickness of the teeth and remainder of the head.



3,905,103
GRASS TRIMMING DEVICE FOR A SPRINKLER
Clancy B. Ford, 6651 18th Ave., Sacramento, Calif. 95820, and Charles E. Ford, 16901 Schoolcraft St., Van Nuys, Calif. 91406
Filed Nov. 25, 1974, Ser. No. 526,454
Int. Cl.[2] B26B *29/00;* **A01D** *35/26*
U.S. Cl. 30—276 **7 Claims**



1. A grass-cutting device for trimming around a hole-recessed sprinkler head, which comprises:
an elongate upright shaft adapted for rotation about a center longitudinal axis therethrough, the elongate shaft having an extension connected to the lower end thereof comprising a casing having a bore therein,
centering means having a first generally cylindrical downwardly depending cup reciprocally supported on said elongate shaft adjacent the lower end of the casing, the first cup having a center longitudinal axis for vertical registry with a sprinkler head when said first cup embraces the sprinkler head,
blade means mounted on the lower end of said casing for rotation with said elongate shaft in a generally cylindrical-shaped cutting path concentric about said sprinkler head, a second generally cylindrical downwardly depending cup operatively connected to said elongate shaft adapted to contact a ground portion above and concentric with said sprinkler head, the second cup being substantially concentric with and enclosing said first cup and the blade means, and

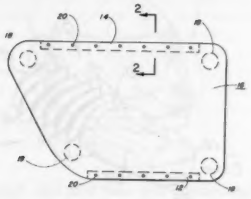
bearing means mounted on said second cup for applying lateral restraint to maintain said elongate shaft upright.

3,905,104

REPLACEABLE LINERS FOR SAW BAR GROOVES

Alva Z. Albright, 2909 Monreo Hwy., Pineville, La. 71360

Filed June 19, 1974, Ser. No. 480,992
Int. Cl.[2] B23D *59/00*
U.S. Cl. 30—384 **1 Claim**



1. In a rectangularly shaped saw bar having four peripheral edges arranged in oppositely disposed pairs, the edges of one said pair being designated respectively as cutting run and opposite run edges, with pulleys mounted adjacent intersections of said peripheral edges for rotation in a common plane thereof:

a. a peripheral groove respectively defined with sides in each of said cutting run and opposite run edges;

b. an open-topped replaceable groove liner, having a solid closed bottom and adapted to fit into and fill each of said peripheral grooves, mounted in said peripheral grooves with said open tops flush with said cutting run and opposite run edges for slidably engaging all elements of an articulated saw chain contacting said saw bar when operationally mounted thereon for rotation therearound; and

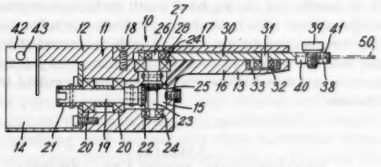
c. a plurality of fastening means adapted to engage in transversely aligned holes defined respectively in said solid closed bottoms of said groove liners and defined in said sides of the peripheral grooves for securing said groove liners therein and for strengthening and stiffening said cutting run and opposite run edges, thereby maximizing the strength and minimizing operational stresses on, and wear of, said saw bar.

3,905,105

SAWS AND BLADES THEREFOR

Michael Anthony Tuke, Sutton, England, assignor to National Research Development Corporation, London, England

Filed Jan. 7, 1974, Ser. No. 431,554
Claims priority, application United Kingdom, Jan. 8, 1973, 1004/73; July 13, 1973, 33565/73
Int. Cl.[2] B23D *49/04;* **A61B** *17/14*
U.S. Cl. 30—393 **9 Claims**



1. A saw comprising:

a hollowed casing;

an eccentric rotary drive member housed in said casing;

an elongated blade-carrying mechanism having a first end portion and an intermediate portion housed in said casing, and a second end portion extending freely from said casing;

one of said first end portion and said intermediate portion being coupled with said drive member for rotation thereby in orbital manner relative to the axis of rotation of said drive member;

the other of said first end portion and said intermediate portion being constrained by said casing for longitudinal translation and pivotal movement in a plane parallel to that of said orbital motion; and

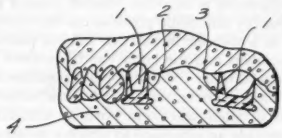
an elongated blade releasably connected with said mechanism second end portion to extend longitudinally therefrom, said blade having teeth which extend in a sequence at least around the free end and along one side of the free end of said blade.

3,905,106

METHOD FOR FABRICATING DENTAL BRIDGES, DENTAL CROWNS AND CORONO-RADICULAR RETAINERS

Eugen Costa; Lucian Ene; Stelica Dumitrescu, and Ion Covaci, all of Bucharest, Romania, assignors to Policlinica de Stomatologie Protetica a Muncipiului Bucuresti, Bucharest, Romania

Continuation of Ser. No. 70,444, Sept. 8, 1970. This application Oct. 19, 1972, Ser. No. 299,017
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **5 Claims**



1. A method of making a dental prosthesis to be received in the buccal cavity in the mouth area having an adjoining tooth region, comprising the steps of:

a. forming a negative impression of said area including the adjoining tooth region;

b. casting a positive rigid adjoining-tooth model from the negative impression formed in step (a);

c. casting a rigid positive impression of the negative impression formed in step (a) and adapted to removably engage said adjoining-tooth model;

d. reproducing the positive impression of step (c) in investment material to form a positive investment model adapted to removably engage said adjoining tooth model;

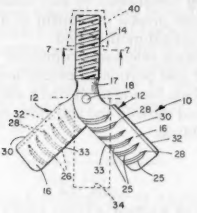
e. joining said adjoining-tooth model with said investment model and forming a prothesis shape therein in wax immediately adjacent said adjoining-tooth model; and

f. investment-casting a molten metal into the space occupied by said wax, said mouth area having at least one tooth stump and said positive impression and said positive investment model having respective tooth-stump formations corresponding to the tooth stump in said mouth area, said prosthesis shape being formed in step (e) at least in part by applying a thin strip of wax around said tooth-stump formation of said investment model, and applying a wax disk corresponding to the occlusal surface of a tooth formation of said positive investment model and shaping the wax on said tooth-stump formation of the latter substantially to contact said adjoining-tooth model, said tooth stump of said mouth region being provided with a copper ring containing a thermoplastic material for entrainment in said negative impression in step (a).

3,905,107
ENDOSSEOUS IMPLANTS

Joseph J. Lenczycki, 89 Florence Rd., Riverside, Conn. 06878

Filed Apr. 25, 1972, Ser. No. 247,420
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A 12 Claims

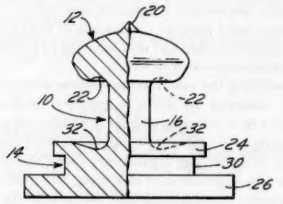


1. An endosseous implant for jawbone implantation comprising a pair of prosthetic anchoring members arranged in juxtaposed relation and pivotally connected to each other at intermediate portions thereof, each of said anchoring members including an anchoring blade portion and a stem portion including an obtuse angle therebetween about a respective intermediate portion, the anchoring blade portions of said two anchoring members being pivotally positionable into closely juxtaposed angular position of the latter and movable to bring the stem portions of said two anchoring members into closely juxtaposed alignment in an other relative angular position of the latter, whereby said blade portions can be disposed within a hole made in a jawbone in said one relative position of said anchoring members and the latter can be pivoted relative to each other to said other relative angular position to separate said aligned blade portions and to anchor the latter within the jawbone and to align said stem portions externally of the jawbone to provide an extension to which a prosthetic device can be fixed.

3,905,108
INTRAMUCOSAL DENTURE SYSTEM

Charles M. Weiss, and Kenneth Judy, both of New York, N.Y., assignors to Oratronics, Inc., New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,952
Int. Cl. N61c *13/08*
U.S. Cl. 32—10 A 23 Claims



1. An intramucosal insert for securing a denture to the mucosal tissue adjacent a patient's jawbone comprising

A. a mushroom-shaped head adapted to be seated in mucosal tissue;

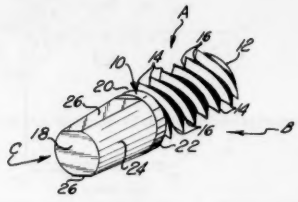
B. a base wider than said head and having a generally planar bottom portion and a generally planar top portion, said top base portion being substantially narrower than said bottom base portion and being undercut to provide an outwardly opening groove adapted to engagingly receive means for securing said base to a denture; and

C. a neck narrower than said head and connecting said head and said base, the underbody of said head defining a downwardly opening groove disposed about said neck and adapted to engagingly receive intramucosal tissue.

3,905,109
DENTAL IMPLANT MEMBER

Bernard D. Cohen, and Abraham Zeewy, both of Cleveland, Ohio, assignors to Crysta-Dent, Inc., Cleveland, Ohio

Filed Mar. 22, 1974, Ser. No. 453,711
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—10 A 4 Claims



1. A dental implant member formed of a generally cylindrical body consisting of

a. a threaded portion adapted to lie in bone having upper and lower ends, said threaded portion defined by a plurality of thread convolutions terminating radially of said body in thread crest and separated axially along said body by thread flanks, and

b. a shank portion having an upper end, and a lower end coterminus with the upper end of said threaded portion, said shank portion consisting of:

i. a cylindrical section adapted to lie in tissue defining the lower end of said shank portion and extending upwardly a distance of at least about .5 mm. from the terminus of the upper thread flank of the uppermost thread convolution defining said threaded portion, the periphery of said cylindrical section and said thread crest lying in a plane parallel to the axis of said generally cylindrical body thereby providing a smooth transition from threaded portion to cylindrical section, essentially constant in radius of curvature, at the location on the installed implant member, which is surrounded by the juncture between bone and tissue, and

ii. a conical frustum section having its base coterminus with the upper end of said cylindrical section.

3,905,110
COMPOSITION AND METHOD FOR DRYING DENTAL SURFACES

Henry L. Lee, Jr., Pasadena, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Filed Nov. 3, 1972, Ser. No. 304,981
Int. Cl. A61c *9/00*
U.S. Cl. 32—15 5 Claims

1. A method of drying hard tooth surfaces comprising applying a solvent blend, comprising at least one solvent capable of forming an azeotropic solution with water and at least one other solvent which is substantially completely miscible in water, to a tooth surface and then permitting said blend to evaporate.

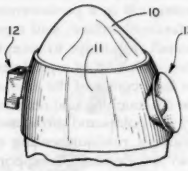
3,905,111
ORTHODONTIC TYING ATTACHMENT

Peter C. Kesling, Green Acres, LaPorte, Ind. 46350

Filed Apr. 3, 1974, Ser. No. 457,465
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A 6 Claims

1. An orthodontic tying attachment for securing an elastic band or thread to a tooth to apply a traction force, said attach-

ment being constructed to be multiple spot welded to band material and comprising a generally dish-shaped body having a base wall and an upstanding wall, said base wall being generally conically shaped with the inner side facing the band material, said upstanding wall being inverted generally frusto-conically shaped with the outer side facing the band material so as to coact therewith and define a substantially cross-sectional



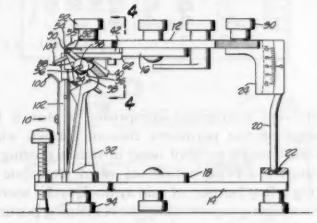
V-shaped channel, and said base and upstanding walls defining at their junction a ridge engaging the band material and a trough opposite thereto, whereby multiple welds are caused at the ridge with the band material upon the placement of electrodes one on the attachment in the trough and one opposite thereto and on the side of the band material opposite the side engaging the attachment.

3,905,112

DENTAL ARTICULATOR

Kenneth H. Swanson, 60 W. Olson Rd., Thousand Oaks, Calif. 91360

Filed June 1, 1973, Ser. No. 366,150
Int. Cl. A61c *17/04*
U.S. Cl. 32—32 **12 Claims**



1. A dental articulator comprising:
a lower frame;
an upper frame;
a pair of condyle means positioned on said lower frame;
a pair of socket means for receiving each of said condyle means respectively, each of said socket means having three functional sides said first side being slidably mounted to said upper frame; means for constraining said first side to remain in a plane co-extensive with the plane of said first functional side associated with the second of said pair of socket means, said second and said third functional sides being mutually perpendicular; means for constraining said second and third functional sides to pivot relative to said upper frame about a first axis which is perpendicular to the plane of said upper frame and about a second axis which pivots about the first axis with said second and said third sides of which is perpendicular to the first axis, each of said sets of three functional sides further defining an occludent position fixed relative to said upper frame for said condyle means.

3,905,113

DENTAL HEALTH TOOL AND METHOD OF DISRUPTING PLAQUE

Joseph Jacob, 30319 Ashton Ln., Bay Village, Ohio 44140

Filed Feb. 22, 1974, Ser. No. 444,849
Int. Cl.² A61H *7/00*
U.S. Cl. 32—40 R **4 Claims**

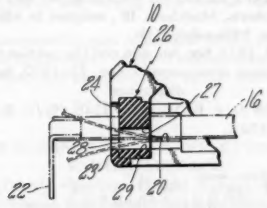
1. A dental health tool, comprising:
a flexible sheet base member having a top and bottom surface;
a plurality of bristles carried by said base member, each bristle having a beginning portion substantially at said bottom surface, said bristle extending through said base member and emanating from said top surface in an erect attitude orientated such that pressure applied to said bristle in a direction along its major axis will be transmitted through the base member to said beginning portion; and
an adhesive coating on said bottom side of said base member, said coating being of a film nature in thickness with said beginning portion protruding, and which is pressure sensitive to human skin,
whereby, when the base member is applied to the finger surface it will hold said bristle beginning portion pressed into intimate contact with the finger nerve endings of the user.

3,905,114

SMILEY COILABLE RULE WITH AUTOMATIC RECOIL SPEED CONTROL

Edward C. Rutty, Portland, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Feb. 22, 1974, Ser. No. 444,818
Int. Cl.² G01B *3/10;* **B65H** *75/16;* **F16D** *63/00*
U.S. Cl. 33—138 **4 Claims**



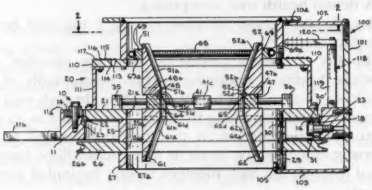
1. A coilable rule comprising a rigid casing having a mouth, a coilable measuring tape of concavo-convex cross-section, a recoil spring having one end secured to said casing and the other end secured to said tape, said spring being operable for the automatic recoil of said tape into said casing through said mouth, a stop at the free end of said tape for preventing the tape from being fully recoiled into the casing, a fixed guide disposed within the casing in alignment with said mouth for guiding the tape through said mouth, and a decelerator positioned between the front wall of the casing and said fixed guide and comprising a soft elastomeric member within the casing adjacent the path of travel of the tape which is friction-

ally engageable therewith during recoil as the tape oscillates as it approaches the end of recoil, said guide comprising a pair of generally inclined rigid surfaces which extend symmetrically inwardly from the side walls of said casing, said decelerator having upper and lower curved surfaces to define a crescent shaped tunnel aperture for the passage of the tape, said pair of rigid surfaces of the guide being horizontally positioned between the upper and lower surfaces of the guide to hold the blade out of contact with the decelerator except during the oscillation of the tape.

3,905,115
GAUGE FOR TUBULAR MEMBERS

Derwin R. Clary, Odessa, Tex., assignor to Trip Inspectors, Inc., Odessa, Tex.

Filed Jan. 7, 1974, Ser. No. 431,125
Int. Cl. G01b *5/10*
U.S. Cl. 33—143 L **30 Claims**



1. A device for determining any deviations in the outer diameter of a tubular member as it is moved longitudinally through the device comprising:

a. support means having a central opening therethrough;

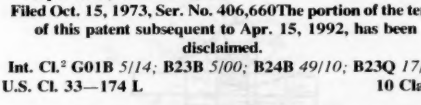
b. means rotatably supported by said support means and co-axially arranged with respect to the central opening, said rotatable means including radially displaceable means for rotatably engaging the tubular member as it is longitudinally moved therethrough; and

c. means associated with said rotatable means for indicating any deviations in the outer diameter of the tubular member as it is moved longitudinally through said rotatable means while said rotatable means rotates around the tubular member.

3,905,116
CRANKSHAFT BEARING MEASURING APPARATUS

George W. Roberts, Markham, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 15, 1973, Ser. No. 406,660The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.[2] **G01B** *5/14;* **B23B** *5/00;* **B24B** *49/10;* **B23Q** *17/00*
U.S. Cl. 33—174 L **10 Claims**

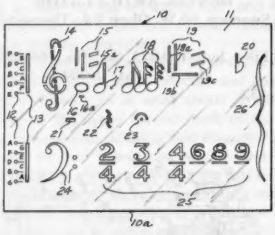


1. A crankshaft measuring apparatus for crankshafts having an axially aligned centering recess of a predetermined taper in each end of the crankshaft with at least one of said recesses having a predetermined axial position relative to the axial center of the crankshaft comprising, a crankshaft support having crankshaft center locating means defining a support axis for supporting the crankshaft axis on said support axis, carrier rail means parallel with said support axis, a carriage mounted on said rail means reciprocally moving on an axis parallel with said support axis, a probe on said carriage including means movably mounting said probe for movement in a plane normal to the support axis including means reciprocally mounting said probe on an axis perpendicular with the support axis, means pivotally mounting said probe on said carriage on an axis parallel with said support axis, means definging a reference surface on said crankshaft support adapted for establishing a zero reference reading for said measuring apparatus, a predetermined tapered surface on said crankshaft support axially positioned in a predetermined axial position relative to said reference surface, said tapered surface positioning said crankshaft responsive to reception in said one of said recesses in the crankshaft of a predetermined axial position relative to the axial center of the crankshaft, a measuring point on said probe for touching said reference surface on said crankshaft support and points and surfaces on said crankshaft, a carriage measurement readout sensing movement of said carriage relative to the crankshaft support for providing a readout of axial dimensions from the reference surface of said crankshaft support and reading axial dimensions on said crankshaft for locating bearing surfaces.

3,905,117
MUSIC STENCIL

Barbara Simon Walton, 3011 Minerva Lake Rd., Columbus, Ohio 43229

Filed Nov. 23, 1973, Ser. No. 418,410
Int. Cl. B41n *1/24*
U.S. Cl. 33—174 B **1 Claim**



1. A drawing instrument comprising a stencil having a straight edge on the perimeter thereof formed with plural openings depicting a symbol used in music scoring wherein said openings comprise a first set of at least one opening representing a first portion of said symbol, and a second set of at least one opening representing the remaining portion of said symbol, said first and second sets of openings being separated from the position in which they would overlap and form the complete symbol by a predetermined distance along a line parallel to said straight edge, and a slot parallel to said straight edge formed on said stencil, the length of said slot being equal to said predetermined length, whereby said slot is used in cooperation with a drawing implement to properly position said second set of openings with respect to the lines using said first set of openings.

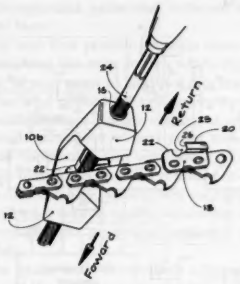
3,905,118
FILE GUIDE

James S. Ballew, Gladstone, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Jan. 28, 1974, Ser. No. 437,501
Int. Cl.[2] **B23D** *63/10*
U.S. Cl. 33—202 **5 Claims**

1. A file guide for filing the cutting edge of a cutting link of a saw chain wherein said cutting link is comprised of a top plate having a leading cutting edge and a depth gauge separated from the top plate by a gullet, said file guide comprising; a reference plate having a bottom surface, two spaced planar

surfaces provided by said bottom surface, one of said spaced planar surfaces being adapted to rest on the depth gauge of the saw chain cutting link and the other spaced planar surface adapted to rest on the top plate of the saw chain cutting link, a pair of lugs depending from said bottom surface and defining a chain receiving channel therebetween, each of said lugs



having an opening and the openings being in alignment with each other for cooperatively receiving and guiding in a predetermined path an elongated round file, said planar surfaces and lug openings being interrelated to selectively locate a file guided within said openings relative to the cutting edge of the saw chain cutting link.

3,905,119

DEVICE FOR TESTING THE CONTOUR OF AN OBJECT

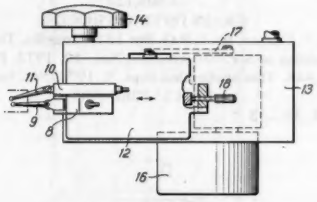
Lothar Meyding, Wetzler, Germany, assignor to Ernst Leitz G.m.b.H.

Continuation of Ser. No. 244,555, April 17, 1972, abandoned. This application Mar. 29, 1974, Ser. No. 456,433

Claims priority, application Germany, Apr. 21, 1971, 2119337

Int. Cl.[2] G01B *5/20, 7/28*

U.S. Cl. 33—179.5 R **8 Claims**



1. A measuring apparatus for determining the relative position of test portions on the contour of an object comprising:

a. a base member;

b. chucking means for holding said object and moving said contour with respect to said base member along a testing path;

c. carrier means adjustably supported on the base member of said measuring apparatus for movement toward and away from said chucking means;

d. a first sensor mounted on said carrier means for being positioned within the range of said test portions;

e. a second sensor mounted on said carrier means for being positioned within the range of said contour and said test portions to contact said contour and said test portions prior to the engagement thereof by said first sensor;

f. drive means for driving said test portions along said testing path at a first speed and at a second speed lower than said first speed; and

g. a control device electrically connected with said sensors and said drive means wherein engagement of said second sensor with said contour of said object causes said control device to switch said first speed to said second speed and simultaneously actuates means for sensing with said first sensor the location of one of said test portions as a function of the position of said test portions along said testing path.

3,905,120

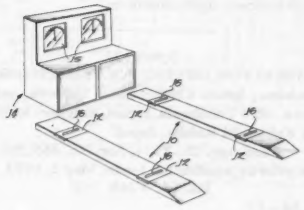
SCUFF GAUGE

Louis L. Butler, Baton Rouge, La., assignor to Bear Manufacturing Corporation, Rock Island, Ill.

Continuation of Ser. No. 234,840, March 15, 1972, abandoned. This application Oct. 3, 1973, Ser. No. 403,045

Int. Cl.[2] G01B *5/255*

U.S. Cl. 33—203.14 **8 Claims**



1. A scuff gauge comprising:

a laterally movable sensing plate adapted to engage a vehicular tire;

a plate housing including a slot therein, said sensing plate being vertically disposed and protruding through said slot, said slot being of greater length than said plate length;

a horizontally disposed base portion supportably mounted over rollers carries and mounts said sensing plate whereby said sensing plate and attached base portion may move laterally, said base portion having an edge portion with a notch formed therein;

a reciprocally movable cam being mounted adjacent said notch and being movable into an extended position whereby said sensing plate is moved to a predetermined reference position;

mechanical-electrical transducer means operatively connected to said sensing plate for converting the lateral movement of said sensing plate into an electrical signal; and

means connected to said transducer means for providing a readout of the degree of wheel misalignment proportional to the electrical signal supplied by said transducer means;

3,905,121

DEVICE FOR INDICATING A DIRECTION ON THE EARTH'S SURFACE

Nobuhiro Takeda, Nagoya; Osamu Yanagi, Tokai; Shigeo Mizuno, Nagoya, and Toyoshi Hayashi, Toki, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Feb. 25, 1974, Ser. No. 445,696

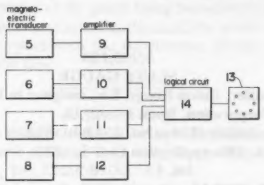
Claims priority, application Japan, Feb. 28, 1973, 48-23094; Mar. 30, 1973, 48-38337[U]; Mar. 30, 1973, 48-36284

Int. Cl.[2] G01C *17/30*

U.S. Cl. 33—361 **15 Claims**

1. A device for indicating a direction of an object on the earth's surface comprising magneto-electric transducer means responsive to terrestrial magnetism to produce an electric output; amplifier means amplifying the output of said magneto-electric transducer means; and indicator means indicating a direction, by an output of said amplifier, according to the

terrestrial magnetism detected by said magneto-electric transducer means in relation to the position of said object, wherein said magneto-electric transducer means has four magneto-



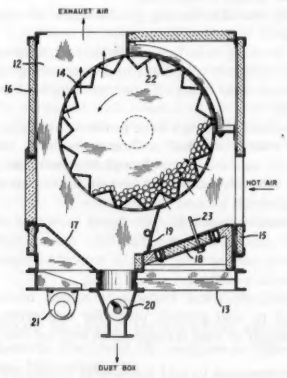
electric transducer elements disposed at right angles with one another and said indicator means has four indicator members thereby to indicate eight directions.

3,905,122

METHOD FOR DRYING POLYMER HYDROGEL

Iwao Ohshima; Seiichi Chiba; Yukio Shibuya, and Haruhiko Ishikawa, all of Yokohama, Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Apr. 29, 1974, Ser. No. 465,299
Claims priority, application Japan, May 2, 1973, 48-49508
Int. Cl.[2] F26B *7/00*
U.S. Cl. 34—17 **13 Claims**



1. A method for drying a polymer hydrogel comprising the following steps in combination:

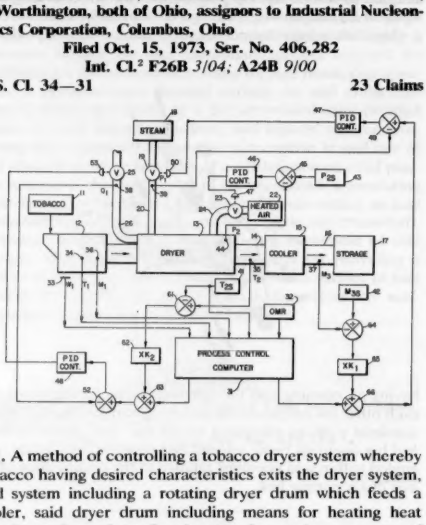
1. extruding the polymer hydrogel through a perforated plate while the polymer hydrogel is cut at a portion between a part thereof received in the holes of the perforated plate and a part continuous to the part received in the holes by the application of a shearing force along a surface of the perforated plate, whereby a plurality of aggregates each consisting of mutually sticking globules of the polymer hydrogel are obtained; and
2. drying the aggregates with hot air in a drying device under rocking or rotation under application of shearing force due to the relative difference in moving speed of the drying device, said shearing force being applied in order to avoid the aggregates from forming a single mass of gel thereof and desintegrate the aggregates with the progress of the drying into individual globules whereby a maximum drying surface of the aggregates is always maintained; thereby to finally dry and disintegrate most of the aggregates into the individual globules substantially showing no tendency of adhesion between each other.

3,905,123

METHOD AND APPARATUS FOR CONTROLLING A TOBACCO DRYER

Ronald James Fowler, Columbus, and Edward James Freeh, Worthington, both of Ohio, assignors to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Oct. 15, 1973, Ser. No. 406,282
Int. Cl.[2] F26B *3/04;* **A24B** *9/00*
U.S. Cl. 34—31 **23 Claims**



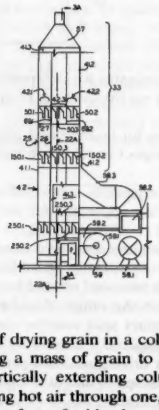
1. A method of controlling a tobacco dryer system whereby tobacco having desired characteristics exits the dryer system, said system including a rotating dryer drum which feeds a cooler, said dryer drum including means for heating heat transfer surfaces thereof and means for passing a current of hot drying gas through the drum, said method comprising the steps of measuring moisture responsive properties of the tobacco being dried, in response to the measured properties deriving a first control signal for the temperature of the dryer wall and a second control signal for the flow rate of the gas, and in response to said first and second control signals concomitantly controlling the temperature of the heat transfer surfaces and the gas flow rate.

3,905,124

GRAIN DRYING PROCESS

Robert P. Cooper, Rt. 1, P.O. Box 151, Amarillo, Tex. 79106

Division of Ser. No. 416,739, Nov. 19, 1973, Pat. No. 3,864,845. This application Sept. 9, 1974, Ser. No. 504,663
Int. Cl.[2] F26B *3/00*
U.S. Cl. 34—33 **3 Claims**



1. In a process of drying grain in a column drier including the steps of passing a mass of grain to be dried downward through a first vertically extending column of rectangular section, while passing hot air through one, preferred vertically extending air inlet surface of said column into said grain mass through said grain and outward of a perforated vertically

extending air outlet surface, the improvements which comprise:

a. passing a first portion of said grain theretofore adjacent said outlet screen downwardly along a surface at an angle greater than the angle of repose of said grain and then toward said inlet screen while supporting and upwardly exposing a surface of said grain mass at its angle of repose directly to the hot air stream and directly passing said hot air from said inlet screen to said upwardly exposed grain surface through said grain and outward of said outlet screen, and then

b. moving the said first portion of grain mass downward of the column along the inlet screen while exposing a vertical surface of said mass to said hot air, and then

c. passing a second portion of said grain theretofore adjacent said outlet screen along a surface at an angle greater than the angle of repose of said grain towards said inlet screen while supporting and upwardly exposing a surface of said grain mass at its angle of repose directly to the hot air stream and directly passing hot air through and outward of said inlet screen to said upwardly exposed grain surface through said grain and outward of said outlet screen, while

d. moving the grain mass theretofore adjacent to the inlet screen toward the outlet screen and then vertically downward in contact therewith and moving said second portion of grain mass downward of the column along the inlet screen while exposing a vertical surface of said mass to said hot air.

3,905,125

COLLAPSIBLE GARMENT DRYER

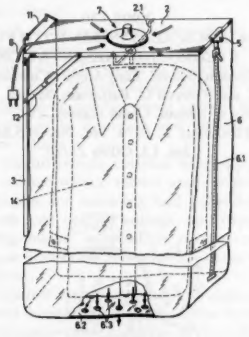
Otto Hubner, Mauerkircherstr. 199, 8 Munich, Germany

Filed Oct. 30, 1973, Ser. No. 411,096

Claims priority, application Germany, Oct. 29, 1973, 2310993

Int. Cl. F26b *13/00*

U.S. Cl. 34—151 **4 Claims**



1. A collapsible garment dryer comprising a case-like hinged container having an upper section and a lower section, hinge means securing said lower section to said upper section adjacent one end, a flexible dryer bag depending from said upper section and received between said upper and lower sections when said garment dryer is in a collapsed condition, a hot air generator in said upper section for directing hot air into said bag, said bag having a closure for inserting garments into said bag and removing garments therefrom, pivotable means secured to said upper section for hanging up garments to be dried in said bag, movable support means attached to said lower section of the container adjacent to said hinge means for hanging up the container, and snap open support means connecting said upper and lower sections for locking said sections when opened to a position 90° relative to each other whereby said lower section provides means for bracing the container against a perpendicular surface.

3,905,126

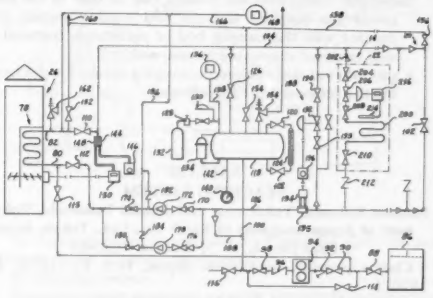
INCINERATOR HOT OIL RECOVERY SYSTEM

Joseph Alfred Villalobos, Ramsey, N.J., and Walter Joseph Elnicki, Monroe, N.Y., assignors to AER Corporation, Ramsey, N.J.

Filed Aug. 13, 1974, Ser. No. 497,106

Int. Cl.² F23G *7/00*; **F26B** *19/00*

U.S. Cl. 34—72 **18 Claims**



9. Apparatus as in claim **8** in which said circulating system includes a feed pipe leading from said first heat exchanger to said installation and a return pipe leading from said installation to said first heat exchanger, a normally-closed by-pass connecting said feed and return pipes, and means responsive to flow of said medium through said return pipe for opening said by-pass to maintain a substantially constant flow of said medium through said first heat exchanger.

3,905,127

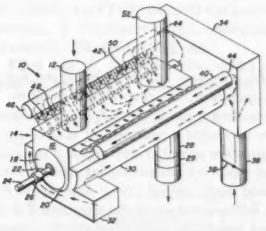
APPARATUS FOR DRYING HEAT SENSITIVE PARTICULATE MATERIAL

David H. Davis, Fairmont, W. Va., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Aug. 26, 1974, Ser. No. 500,487

Int. Cl.² F26B *11/02*

U.S. Cl. 34—182 **7 Claims**



1. Apparatus for drying moisture containing particulate material comprising,

enclosed conveying means for longitudinally conveying the particulate material in a loose bed,

said enclosed conveying means having an inlet for receiving the particulate material to be dried and an outlet for discharging the dried particulate material,

a shell positioned around the lower portion of said conveying means for receiving a gas at an elevated temperature, said shell arranged in heat transfer relation with a portion of the outer surface of said enclosed conveying means so

that the heat from the gas is transferred by conduction through said enclosed conveying means to dry the particulate material therein,

a gas inlet connected to one end of said shell for directing the gas thereto,

gas tempering means communicating with said shell for reducing the temperature of the gas,

conduit means extending parallel to said enclosed conveying means and connecting said gas tempering means with said enclosed conveying means for conveying the tempered gas into intimate contact with the moving bed of particulate material in said enclosed conveying means, and thereby dry the particulate material by convection,

means for controlling the volume rate of flow of the tempered gas supplied through said conduit means into contact with the moving bed of particulate material in said enclosed conveying means, and

a gas outlet in said enclosed conveying means for discharging the tempered gas therefrom.

3,905,128
TEACHING SYSTEM

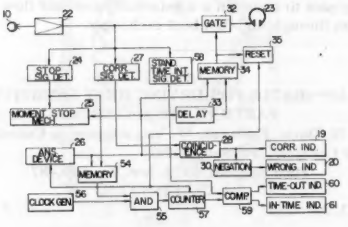
Masami Koizumi, Yokohama, and Satoshi Yamauchi, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1973, Ser. No. 403,403

Claims priority, application Japan, Oct. 12, 1972, 47-102021

Int. Cl.[2] G09B 7/00

U.S. Cl. 35—8 A **8 Claims**



1. A teaching system comprising means for providing an answer manipulation, a recording medium, reproducing means for detecting a audio signal from the recording medium on which are recorded a plurality of sets of signals, each set including a question signal, a stop signal a standard time interval signal and a correct answer signal, said reproducing means converting said audio signal into a sound and causing reproducing to be interrupted when the stop signal is detected from the recording medium, said reproducing means resuming reproducing in response to an answer manipulation, and comparison and indication means for comparing the correct answer signal detected from the recording medium after the reproducing means has resumed reproducing with an answer produced by said answer manipulation and for indicating the result of the comparison, further including time indication means for determining the length of time from the interruption of the operation of the reproducing means which occurs in response to the stop signal until an answer manipulation is made and for indicating the result of comparision of such length of time with the standard time interval detected from the recording medium.

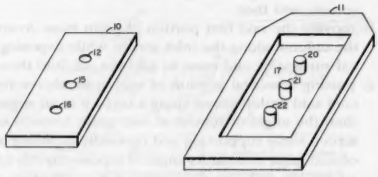
3,905,129
TRUE DIMENSIONING AND TOLERANCING DEMONSTRATOR

Thomas Berilla, 2615 Highbee Rd., Md. 20783; James B. Long, 8810 Braeside Dr., Lanham, Md. 20810, and Clyde D. Martin, 1754 Lanier Pl., N.W., Washington, D.C. 20019

Filed May 24, 1974, Ser. No. 473,015

Int. Cl. G09b 25/02

U.S. Cl. 35—13 **4 Claims**



1. An apparatus for demonstrating the interconnectability and interchangeability of members having dimensions within maximum material condition and least material condition comprising:

at least three substantially similarly shaped embodiments of a first member, a first of said embodiments having the dimensions of maximum material condition, a second of said embodiments having the dimensions of least material condition, and the third of said embodiments having dimensions between maximum material condition and least material condition, and

at least three substantially similarly shaped embodiments of a second member designed to interconnect with said first member, a first of said embodiments having the dimensions of maximum condition, a second of said embodiments having the dimensions of least material condition, and the third of said embodiments having dimensions between maximum material condition and least material condition.

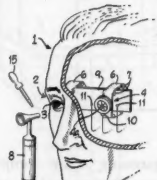
3,905,130
OPHTHALMOLOGICAL MANIKIN WITH FUNDUSCOPIC EYEGROUND PRESENTATION

Michael S. Gordon, Miami, Fla.; August Colenbrander, Larksbur, Calif., and Darrell G. Patterson, Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed May 1, 1974, Ser. No. 465,847

Int. Cl. G09b 23/32

U.S. Cl. 35—17 **10 Claims**



1. An ophthalmological simulation device for presenting funduscopic eyegrounds for viewing with an ophthalmoscope comprising:

a. means for simulating the exposed portion of a human eye including a transparent cornea;

b. adjustable aperture means disposed inside said corena for simulating a human iris;

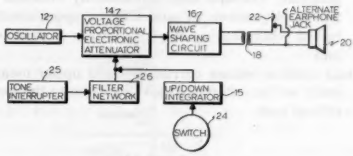
c. optical means for directing incoming light from said ophthalmoscope passing through said adjustable aperture means;

d. film means having funduscopic eyeground representations thereon disposed behind said adjustable aperture means for presenting said eyeground representations to illumination by said light;
e. reflective means disposed behind said film means for reflecting the incoming light back through said eyeground representations for viewing with said ophthalmoscope; and
f. means for sensing the incoming light passing through said adjustable aperture means for controlling the aperture opening.

3,905,131
AUDIOMETRIC PRETEST TRAINER

Michael D. Feezor, and Mack J. Preslar, both of Chapel Hill, N.C., assignors to Audiometric Teleprocessing, Inc., Chapel Hill, N.C.

Filed Oct. 11, 1973, Ser. No. 405,677The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.
Int. Cl. G09b *25/00*
U.S. Cl. 35—13 **9 Claims**

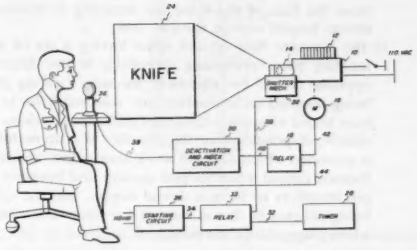


1. An audiometric training device whose operation is audibly learned by the examiner's response to audio signal intensities heard and switch controlled by the examiner comprising, in combination:
a. oscillator circuit means productive of a continuous audio frequency signal;
b. first circuit means comprising logarithmic signal converting means coupled to said audio oscillator means for converting said audio signal to logarithmic form;
c. control voltage source means adapted to produce an ascending and descending ramp control voltage which is controllable as to direction and having maximum and minimum values;
d. second circuit means coupled to said first circuit and control voltage source means and comprising summing circuit means for summing said logarithmic converted signal with said control voltage, and exponential signal converting means adapted to convert said combined logarithmic converted and control voltage signal to exponential form;
e. voltage control means coupled with said control voltage source and comprising a two position switch adapted in a first position to cause a change in control voltage corresponding to a decrease in audio signal intensity, and in a second position to cause an opposite change in control voltage corresponding to an increase in audio signal intensity;
f. output circuit means coupled to said second circuit means and comprising an output signal conditioning amplifier and disconnectable loudspeaker means providing a source for said examinee to hear said signal intensity and to respond thereto by operating said two position switch;
g. a direct current power source having a disconnect switch and connected to power all of the above mentioned means; and
h. a portable cabinet mounting said loudspeaker means and enclosing said oscillator circuit means, said first circuit means, control voltage source means, second circuit means, output circuit means and said direct current power source.

3,905,132
HIDDEN KNOWLEDGE DETECTOR

Frederick N. Dyer, Altamonte Springs, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 7, 1974, Ser. No. 521,987
Int. Cl.² G09B *19/00*
U.S. Cl. 35—22 R **6 Claims**

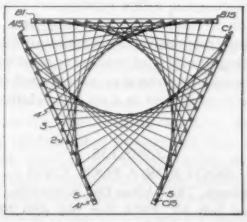


1. Apparatus for identification of specific interests and knowledge of a testee comprising:
a. a display means
b. a color image generator actuable alternately to projecting and interrupting conditions to project to said display means a series of simultaneously displayed word-color combinations in rapid order for testee identification of color only as quickly as possible while said generator is projecting
c. a timer for measuring time elapsed during each generator projecting condition, and
d. activation and deactivation circuits connected to condition said generator to projection condition and activate said timer simultaneously and to deactivate both generator and timer upon oral response by said testee to measure and record thereby the time delay in testee's response to each word-color combination displayed for color identification and to thereby evidence any interference factor resulting from specific interest and/or knowledge of the word image presented.

3,905,133
THREAD OR THE LIKE DESIGNS, DRAWINGS, PICTURES, PATTERNS AND CREATIONS

Phillip Charman, 4 Thirlmere Cres., Normanby, Middlesbrough, Teesside, TS6 OEU, England

Filed Apr. 5, 1974, Ser. No. 458,120
Claims priority, application United Kingdom, Apr. 10, 1973, 17199/73
Int. Cl.² A63H *33/08*
U.S. Cl. 35—27 **3 Claims**



1. A kit for making a variety of thread designs, the kit comprising

1 a base board having a multiplicity of plug receiving holes therein,

2 a plurality of thread receiving strip members, each strip member comprising

i a resilient spine

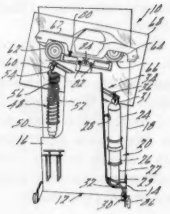
ii a plurality of spaced apart and substantially rigid thread receiving pin members attached to and protruding from one face of the spine, each pin member having a shank upon which is at least one enlarged portion spaced from the face of the spine for retaining in position a thread looped around the pin, and

iii the opposite face of said spine having a set of strip locating plugs projecting therefrom in the direction opposite to said pin members, the strip locating plugs being adapted to be inserted into selected holes in the base board whereby a choice of different positions and relative dispositions for the plurality of strip members is provided which define a work area across which the threads extend when looped around and between the pin members to form a thread design, and the spline being adapted to flex at least in the plane of the board when plugged into the board.

3,905,134
AIR ADJUSTABLE SHOCK ABSORBER DEMONSTRATION STAND

Donald B. Greenleaf, Dearborn, and Dennis J. Smith, St. Clair Shores, both of Mich., assignors to Monroe Auto Equipment Company, Monroe, Mich.

Filed Mar. 25, 1974, Ser. No. 454,381
Int. Cl.² G09B *25/00*
U.S. Cl. 35—49 **15 Claims**



1. In an apparatus for demonstrating how the operation of a fluid adjustable vehicular leveling unit affects the orientation or relative attitude of the sprung portion of a vehicle relative to the unsprung portion thereof,

a first structure depicting a visual representation of one of the vehicle portions;

a second structure movable supported adjacent said first structure and depicting a visual representation of the other of the vehicle portions, said first and second structures normally being oriented such that said vehicle portions are disposed in a first relative orientation; and

means operatively supporting a leveling unit, and

actuating means responsive to operation of the leveling unit for displacing one of said structures relative to the other thereof to cause said visual representation of said vehicle portions to be disposed in a second relative orientation.

3,905,135
BOOT FOR A FOOT CAST

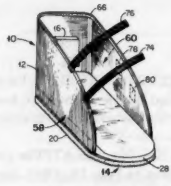
Autrey O. V. Debusk, 7324 Afton Dr., Knoxville, Tenn. 37918

Filed July 10, 1974, Ser. No. 486,993
Int. Cl.² A43B *00/00*
U.S. Cl. 36—2.5 R **5 Claims**

1. A flexible boot for covering a surgical foot cast having heel, toe and side portions, said boot comprising

flexible sole means including flexible outsole means of a wear-resistant, waterproof, flexible material and insole means of a resilient, closed cell sponge material overlaid on and bonded to said outsole,

unitary upper means having a generally semicircular plan including a generally straight bottom edge, said bottom edge of said upper means being formed about the side and heel perimetral portion of said insole means and joined to said sole means along a portion of the perimetral margin



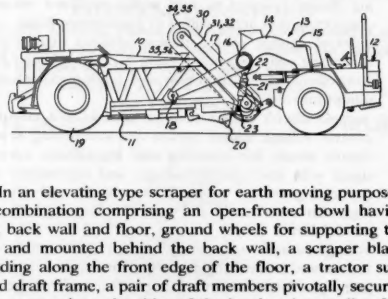
of said sole means, the remainder of said upper means extending upwardly from said sole margin to define a generally U-shape that substantially encloses the sides and heel portions of said cast to approximately ankle height while leaving the toe portion of said boot open, and

heel cushion means carried by said upper means on the inner surface thereof in juxtaposition to the heel portion of said cast.

3,905,136
GROUND SUPPORTED ELEVATOR IN ELEVATING TYPE SCRAPER

John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Oct. 30, 1974, Ser. No. 519,056
Int. Cl.² B60P *1/36*
U.S. Cl. 37—8 **5 Claims**



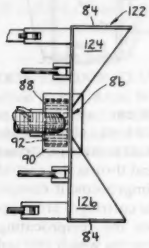
1. In an elevating type scraper for earth moving purposes, the combination comprising an open-fronted bowl having sides, back wall and floor, ground wheels for supporting the bowl and mounted behind the back wall, a scraper blade extending along the front edge of the floor, a tractor supported draft frame, a pair of draft members pivotally secured at the rear ends to the sides of the bowl and extending forwardly and upwardly having rigid connection at their front ends to the draft frame, means including an actuator interposed between the draft frame and the front end of the bowl and having control means for adjusting the degree of tilt of the bowl about its supporting wheels and hence the depth of cut of the blade, an elevator positioned at the open front end of the bowl, the elevator having a frame including a pair of frame members and which extends upwardly and rearwardly from the region of the blade and which is pivoted to the bowl for forward and upward swinging movement about a transverse axis, the elevator having a pair of endless chains with transversely arranged flights, the chains having means for driving at the upper end of the frame and trained about rollers at the lower end so that the flights sweep the soil loosened by the blade backwardly into the bowl, ground engaging shoes having adjustable mounts connected to the frame members for engag-

ing the undisturbed ground surface slightly ahead of the flight envelope for supporting the elevator at a running height at which the flight envelope is maintained at a sweeping clearance above the undisturbed ground level, the shoes being movable on their mounts with respect to the elevator frame to adjust the maintained sweeping clearance, and means coupled to the mounts for positioning the shoes simultaneously in the same running position relative to the frame.

3,905,137
UNDERWATER TRACTOR AND IMPLEMENT THEREFOR

James E. Gee, Washington, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Feb. 21, 1974, Ser. No. 444,317
Int. Cl.[2] E02F *3/88*
U.S. Cl. 37—56 **4 Claims**



1. Apparatus for working the floor of a body of water comprising: a submersible vehicle positionable on said floor; means for transporting the vehicle over said floor; conduit means having one end disposed adjacent said vehicle, and the other end positionable above the surface of the water; means associated with the vehicle for directing the material from the floor to adjacent the one end of the conduit means; and means for transporting the material entering the one end of the conduit means through the conduit means and from the other end thereof, wherein the means for directing material from the floor to adjacent the one end of the conduit means comprise angled wing means disposed forwardly of the vehicle and comprising a plurality of wings, each angled upwardly and inwardly in the rearward direction.

3,905,138
STEAM IRON SHOE

Antonio Abolafia, New York, N.Y., assignor to Excelsior Belting-Equipment Co., Inc., New York, N.Y.

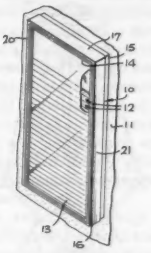
Filed June 20, 1974, Ser. No. 481,142
Int. Cl.[2] D06F *75/38*
U.S. Cl. 38—97 **21 Claims**

1. A steam iron shoe comprising a body having a flat horizontal bottom wall portion, said portion comprising a top layer of non-ferrous metal, an intermediate layer of cloth treated with a high heat resisting material of at least 400°F melting point, and a bottom layer of high heat resisting material having a melting point of about 500°F., all of said layers having registering, spaced perforations throughout.

3,905,139
DIRECTORY DISPLAY CASE

Andrew K. Cooper, 22635 Flamingo St., Los Angeles, Calif. 91364

Filed Oct. 29, 1973, Ser. No. 410,510
Int. Cl.[2] G09F *13/12*
U.S. Cl. 40—64 R **5 Claims**



1. An illuminated display directory adapted to be mounted on the exterior wall surface in the lobby of a building, the combination comprising:

a case having a back section, a top section, a bottom section and a pair of side sections;

a door pivotally mounted between said top and bottom sections along a selected one of said side sections;

said door having a continuous frame extrusion holding a sheet of transparent material and adapted to occupy an area leading into the interior of said case;

a plurality of strips removably held in a stack as an assembly between said pair of side sections and each strip provided with transparent portions characterized as indicia;

illuminating means carried on said back section behind said plurality of strips so as to radiate light energy through said strip indicia transparent portions;

said assembly including a pair of retainers carried on a further panel composed of translucent material removably carried between said pair of side sections and said pair of retainers having means whereby said plurality of strips have their opposite ends removably disposed in said retainer means;

light reflector means mounted about said illumination means for intensifying the light energy radiated to said plurality of strips;

said illuminating means comprises a pair of fluorescent lights mounted substantially along the centerline of said case; and

each of said strips includes a top edge having a V-shaped projection and a bottom edge having a V-shaped slot whereby respective adjacent edges of said strips mate in a nested, stacked relationship.

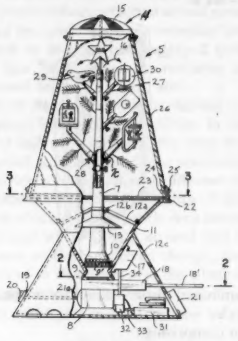
3,905,140
ANIMATED DISPLAY TREE-FRAME

Frank Damiano, 322 Washington St., Newburgh, N.Y. 12550

Filed Apr. 3, 1974, Ser. No. 457,442
Int. Cl.[2] G09F *19/02*
U.S. Cl. 40—106.25 **5 Claims**

1. A display tree-frame device comprising in combination: a fluent light weight particulate; an upright tubular trunk means for providing trunk tubular structure including a trunk conduit structure and branch structures mounted on and extending from the trunk conduit structure, the branch structures having unobstructed passages in flow communication with the trunk conduit; the trunk conduit structure and the branch structures respectively, having outlet ports located at substantially distal upper ends thereof to the conduit structure and to the passages respectively, and having a base inlet port at a base of the trunk conduit structure, such that there is unobstructed fluid flow of fluid having the light weight particulate suspended therein through the trunk conduit and unob-

structed passages serially respectively; enclosure means for substantially totally enclosing said upright tubular trunk means and branch structures, a major portion of the enclosure means being of substantially transparent sheet-like material through which upper portions of the upright tubular trunk means are visibly discernable; pump means for propelling a



fluid composition as a carrier for the light-weight particulate into the inlet port and out of the outlet ports; and rotatable ornaments having fluid-drivable turbine motor means being mounted on at least one of the branch structures at the outlet port thereof such that flow of fluid from the outlet port thereof drives the turbine motor means.

3,905,141

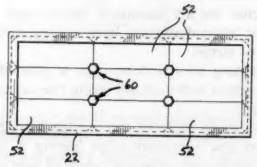
LIGHT FIXTURE WITH LUMINOUS SIGNS

Sidnor Tebbs Chichester, Jr., 2529-A P St., N.W., Washington, D.C. 20007

Continuation-in-part of Ser. No. 275,342, July 26, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 434,928

Int. Cl.[2] **G09F** *07/18*

U.S. Cl. 40—125 F **1 Claim**



1. A sign fixture comprising a generally open frame assembly formed of a plurality of interconnected, angled frame members, a sign panel assembly of translucent plastic material mounted on at least one side or end of said frame assembly, said panel assembly comprising an inner backing panel having a plurality of openings therethrough, and a plurality of outer panels positioned in adjacent non-overlapping relationship with each other; and means for removably connecting said outer panels to said backing panel so as to permit convenient replacement of one or more of said outer panels without affecting said inner backing panel, said removable connecting means comprising a clamp assembly having one end attached to said backing panel, a resilient expansible body portion extending through one of said openings in said backing member and outwardly beyond said outer panels, and a nut member removably attached to said body portion of said clamp assembly, wherein said resilient, expansible body portion comprises a spring and said nut member is internally threaded to removably receive the adjacent end of said spring, and wherein certain of the corners of said outer panels are bevelled, said nut member serving to permit manipulation of said spring without removing said nut member thereby to permit manipulation of said spring for removing one or more of said outer panels to be replaced while said clamp assembly remains intact.

3,905,142

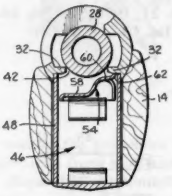
FIREARM MAGAZINE FOLLOWER

Philip R. Haskell, Easton, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Feb. 11, 1974, Ser. No. 441,235

Int. Cl.[2] **F41C** *25/02*

U.S. Cl. 42—18 **8 Claims**



1. In a double column cartridge magazine for use with a firearm having a frame and a chamber and a bolt means which reciprocates within said frame and strips individual cartridges from the magazine and thrusts the cartridge into the chamber of the firearm, the improvement comprising a spring-biased follower on which the cartridges are supported, means biasing said follower towards the reciprocating bolt, said follower having a lower surface on which one column of cartridges is supported and an upper surface on which the second column of cartridges is supported thus effecting a staggering of the columns of cartridges, and a bearing means on said follower which is not in engagement with either of said columns of cartridges and which extends outwardly from said second surface to engage the frame of the firearm when the magazine is empty of cartridges so as to prevent frictional contact of the bolt with the second surface of the follower when the bolt is reciprocated in the firearm frame.

3,905,143

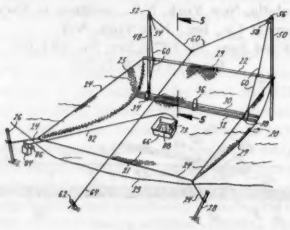
FISHING NET

Eugene M. Poirot, Golden City, Mo. 64748

Division of Ser. No. 206,789, Dec. 10, 1971, Pat. No. 3,815,279. This application Apr. 15, 1974, Ser. No. 461,224

Int. Cl.[2] **A01K** *69/10, 73/12*

U.S. Cl. 43—7 **12 Claims**



1. A fishing net which is flexible and which has a portion of the upper edge thereof selectively disposable beneath the surface of a body of water to permit fish within said body of water to enter an area defined by said net, said portion of said upper edge of said fishing net being selectively disposable close to said surface of said body of water to trap said fish within said area, a section of said fishing net having an elon-

gated opening therein which is many times longer than the maximum dimension of any pore of said fishing net, an elongated gauging element disposed at and defining one side of said elongated opening in said section of said fishing net, a second elongated gauging element disposed at and defining the opposite side of said elongated opening in said section of said fishing net, said elongated gauging elements having the confronting surfaces thereof spaced apart a predetermined distance, said predetermined distance being smaller than the thickness of fish that are to be held within said area defined by said fishing net but being larger than the thickness of fish that are to be permitted to escape from said area defined by said fishing net, and supporting means for said section of said net which holds said section of said net at a desired level relative to said surface of said body of water, said supporting means helping hold said elongated gauging elements at least in part beneath said surface of said body of water whenever said section of said fishing net is disposed beneath said surface of said body of water, whereby said elongated gauging elements will permit small fish to escape from said area defined by said fishing net while said section of said fishing net is disposed beneath said surface of said body of water.

3,905,144

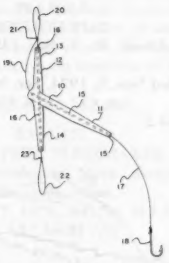
FISHHOOK LEADER STANDOFF

Robert F. Shaw, Marlton Lakes, Atco, N.J. 08004

Continuation-in-part of Ser. No. 334,722, Feb. 22, 1973, abandoned. This application Jan. 11, 1974, Ser. No. 432,616

Int. Cl.[2] **A01K** *97/00*

U.S. Cl. 43—42.74 **5 Claims**



1. A fishing line standoff and leader combination for receiving and positioning a fishhook and immediately associated leader portion comprising:

a vertically extending base member including a first axially extending passageway therethrough;

a horizontally extending arm member formed integral with the base member at the juncture of one end of the arm member and substantially the midpoint of the base member, said arm member including a second axially extending passageway therethrough; and

a leader threaded through the second passageway toward the midpoint of the base member, tied off in a loop and threaded downwardly through the first passageway to another tie off permitting the standoff to be vertically suspended while maintaining the fishhook and immediately associated leader portion in a horizontal position.

3,905,145

GRAB-ALL FISH HOLDER

Maceo Cunningham, 2004 Jasper St., Washington, D.C. 20020

Filed Nov. 28, 1973, Ser. No. 419,793

Int. Cl.[2] **A01K** *97/00*

U.S. Cl. 43—53.5 **4 Claims**

1. A fish holder intended for use by a fisherman in the temporary holding of a still live struggling fish in a secure and safe manner to permit removal of a fishing hook from the fish's mouth to free the fishing line for further usage, the fish holder comprising:

a hollow substantially funnel-shaped open ended rigid body member having a bottom end of a larger cross-sectional area than a top end thereof and adapted to receive the body of fish therethrough with the head and tail of the fish projecting from the open top and bottom ends respectively, said funnel-like body member including a rigid truncated hollow conical portion having a circular bottom base end and a circular top end with a conical shaped side wall interconnecting said top and bottom ends, and an elongated cylindrical body portion having a diameter substantially equal to the diameter of said conical portion top end, said cylindrical portion having a top end and a bottom end and a cylindrical side wall, said cylindrical bottom end being permanently affixed to said conical portion top end concentric therewith and extending axially outwardly therefrom;

a longitudinal slot extending through the body member from said conical portion base end longitudinally through said conical side wall and said cylindrical side wall and terminating at said cylindrical top end, the slot being of a width to permit a fishing line to pass freely therethrough;

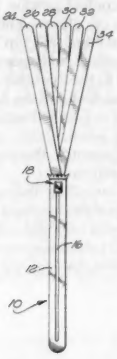
an elongated rectangularly shaped opening disposed vertically in said cylindrical side wall surface at a position spaced circumferally from said slot and extending parallel to said slot; and

a knife-like clamping element mounted in the body member and frictionally associated with the opening therein and adapted to pass through the opening to engage the body surface of a fish drawn into the body member to retain the fish in a position with the head projecting outwardly of the top end of the body member to permit ease of removal of the fishing hook from the mouth of the fish, said knife-like clamp member being of an arcuate longitudinal configuration having rectangularly shaped cross-section with a handle end projecting outwardly of said slot and a fish engaging jaw end projecting inwardly of said slot, said fish engaging jaw end of said clamp member provided with a plurality of vertically spaced apart outwardly projecting serrated triangular shaped teeth forming members to securely engage the body of a fish within the body member, said clamp member movable in a vertical plane into and out of said slot between a fish retaining position engaging a fish inwardly of the body member with said fish engaging jaw end to retain the fish in position therein, and a fish releasing position wherein said fish engaging jaw end is spaced apart from the body of said fish to permit insertion of and removal of said fish from said body member.

3,905,146
FLY SWATTER

Carleton H. Ralston, 2227 Maricopa Dr., Los Angeles, Calif. 90065

Filed Nov. 18, 1974, Ser. No. 524,597
Int. Cl.[2] A01M *3/02*
U.S. Cl. 43—137 7 Claims

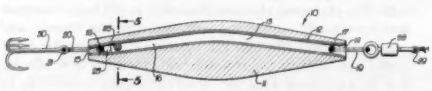


1. A fly swatter comprising:
a hollow handle defining a mouth and defining a first slot therethrough extending in a direction along its longitudinal axis intermediate the ends thereof;
cam means disposed at said mouth of said handle;
a slide means disposed in said slot;
a plurality of arms in said hollow handle, said arms defining differently offset mounting holes with reference to a longitudinal center line of said arms laterally aligned;
means pivotally mounting said arms to said slide means at its respective mounting hole, whereby said arms form a fan-like structure upon moving said slide means toward the mouth of said handle.

3,905,147
FISHING LURE

Eugene A. Snipes, 1675 Pennsylvania Ave., Colton, Calif. 92324

Filed Jan. 7, 1974, Ser. No. 431,238
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—17.1 2 Claims

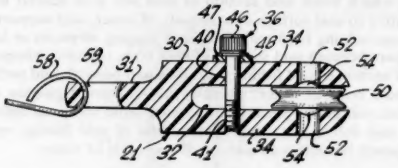


1. A fish lure comprising:
a flattened body streamlined to resemble the body of a bait fish;
there being a passage formed lengthwise in said body and co-terminal therewith;
means for attaching a trolling line to the leading end portion of said body;
means for attaching a hook means to the trailing end portion of said body,
a jet of water being emitted from the trailing end of said passage to produce a sonic action which excites the fish to strike said lure,
lengthwise spaced restrictions being provided in said passage without shutting off the flow of water through said passage; and
a bead trapped in said passage between said restrictions, causing said bead to be agitated by water flowing through said passage thereby producing a rattling noise which attracts fish to the lure.

3,905,148
OUTRIGGER FISHING LINE SYSTEM WITH LINE RELEASE

Phillip L. Naone, 84-287 Holt St., Waianae, Oahu, Hawaii 96792, and Raymond R. Turner, 9822 Cheshire Ave., Westminster, Calif. 92683

Filed June 17, 1974, Ser. No. 479,628
Int. Cl. A01k *91/00*
U.S. Cl. 43—43.12 5 Claims

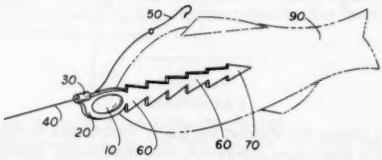


1. A fishing line guide releasable by a jerk on the line of predetermined magnitude, comprising:
a body having a slot therein,
a fishing line sheave rotatable on said body in said slot,
means mounting the sheave for rotation in the slot for release of the sheave from the slot in response to a jerk in a fishing line looped about said sheave.

3,905,149
BAIT HOLDER

Marvin H. McCloud, Rt. 1, Box 135C, Stevensville, Mont. 59870

Filed Nov. 5, 1974, Ser. No. 521,163
Int. Cl.[2] A01K *83/06*
U.S. Cl. 43—44.2 4 Claims



1. A bait holder comprising:
a lead weight;
a flat metal frame surrounding the weight and extending forwardly therefrom to form a series of barbs placed end to end; and
means disposed on the frame rearwardly of and above the weight slidably attaching the frame to a fishing line.

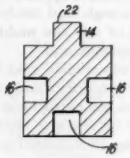
3,905,150
BLOCKS HAVING SOCKETS AND PROJECTIONS WITH INTERFERENCE FIT

Alan William Dawn, Fareham, England, assignor to E. S. Perry Limited, England

Continuation of Ser. No. 208,700, Dec. 16, 1971, abandoned.
This application Aug. 16, 1973, Ser. No. 388,749
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—25 5 Claims

1. An educational aid for teaching mathematic and scientific concepts involving weights and measures, said aid comprising a plurality of solid cubes interconnected together to define an assembled, structurally stable educational aid of desired shaped for teaching a selected scientific concept, each

of said cubes having six faces and having edges of unit length, and being constructed of an injection molded, stiffly resilient plastic, a single solid unitary projection projecting centrally of one of said faces of each cube, one of said faces being completely planar on each cube, a single socket located centrally in each of the remaining cube faces, each socket including a bottom portion and an outer opening portion and being shaped and dimensioned to receive the projection of an adjacent cube, the faces of each adjacent interconnected cube being in face to face relationship, an interference fit being defined by a socket of one cube receiving a projection of an adjacent interconnected cube, said interference fit including said bottom portion of said socket being expanded relative to



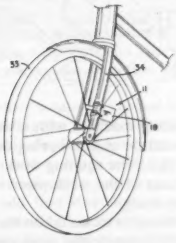
said outer opening portion, each said projection interconnected with another cube catching behind edges defining said opening portion of a socket of an adjacent interconnected cube for providing an interlocking plurality of said cubes which cooperate to define a structurally stable assembly of desired size, shape and weight, said projections and said sockets being square in shape and the upright edges of each projection and the upright corners of each socket having a curvature, the radius of curvature on said projection curvature being greater than the radius of curvature of said corners, said curvatures defining air passage means for the escape of air displaced from the socket by the insertion of a projection of another cube thereinto.

3,905,151

VELOCIPEDE NOISEMAKER

Robert D. Zweigle, Bloomington, Minn., assignor to Zweigle Advertising, Inc., Minneapolis, Minn.

Filed Apr. 17, 1974, Ser. No. 461,544
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—174 **9 Claims**



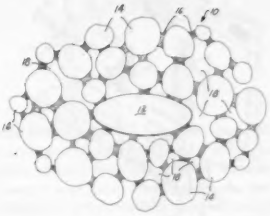
1. A noisemaking device adapted to be attached to a velocipede support adjacent a spoked wheel which comprises a substantially planar sheet of flexible material forming a body, said body having first and second fingers, a reed extending from a first end of said body and formed by substantially parallel slots extending from said first end and terminating near the center of said body, said reed being intermediate said fingers, first and second tabs extending from a first side of said body and aligned with the longitudinal axis of said first and second fingers respectively, said body having first and second apertures in said body, stop means on a second side of said body beyond the terminations of said slots and positioned between said tabs and apertures and a connecting element attached to said first and second tabs and engaging said first and second fingers and extending through said first and second apertures to form said first and second fingers about said support to secure said noisemaking device to said velocipede and hold said reed in position to contact spokes of said spoked wheel.

3,905,152

COATED SEEDS

John C. Loperfido, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 2, 1974, Ser. No. 485,254
Int. Cl. A01c *1/06*
U.S. Cl. 47—57.6 **25 Claims**



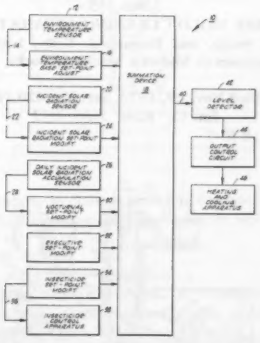
1. A coated seed comprising a seed bearing a coating which comprises a plurality of non-porous, hydrophobic, nonphytotoxic particles which are adhered to each other and to the seed by means of a hydrophilic binder which is present in an amount not exceeding 10 percent by weight of said coating, and wherein said coated seed has a porosity characteristic of at least 15 percent total porosity with at least 12 percent of the total pore volume being due to the presence of pores having a diameter between 2 and 100 microns.

3,905,153

AUTOMATIC INTERIOR ENVIRONMENT CONTROL

William L. Enter, 7705 Aquaclear Rd., Mustang, Okla. 73064

Filed Jan. 9, 1974, Ser. No. 431,682
Int. Cl. A01g *9/14*
U.S. Cl. 47—58 **4 Claims**



1. A method of temperature control in greenhouses comprising the steps of:

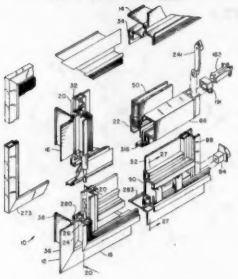
automatically controlling the temperature as sensed within a greenhouse through adjustment to a predetermined set-point; and

further adjusting said set point during dark periods in proportion to the amount of sunlight sensed during the preceding daylight period.

3,905,154
BUILDING STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Manufacturing Company, Owensboro, Ky.

Division of Ser. No. 36,303, June 22, 1970, Pat. No. 3,711,995.
This application Jan. 22, 1973, Ser. No. 325,337
Int. Cl. E05d *15/22*; **E06b** *7/16*
U.S. Cl. 49—485 **12 Claims**

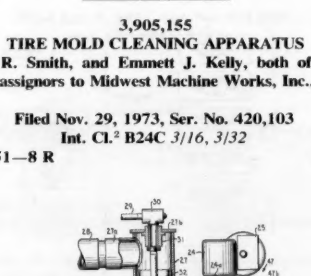


1. Window structure for installation in either a vertical or right or left horizontal position including a frame having a head, jambs and a sill, at least one sash slidably movable in the plane of the window and tiltable about one edge thereof out of the plane of the window, which sash includes sash jambs entirely in spaced relation to the complete jambs of the window frame inwardly of the window frame from the frame toward the sash in the plane of the window when the sash is in the plane of the window and means positioned between the frame and sash for permitting the selective movement of the sash within the plane of the window and the tilting of the sash out of the plane of the window, and sealing means secured to at least one of the window frame jambs and the sash jambs extending between the sash and the frame in the plane of the window structure for sealing therebetween with the sash in a closed position.

3,905,155
TIRE MOLD CLEANING APPARATUS

Leonard R. Smith, and Emmett J. Kelly, both of Topeka, Kans., assignors to Midwest Machine Works, Inc., Topeka, Kans.

Filed Nov. 29, 1973, Ser. No. 420,103
Int. Cl.[2] **B24C** *3/16, 3/32*
U.S. Cl. 51—8 R **7 Claims**



1. A tire mold cleaning apparatus for removing vulcanization residue from the molding surface of a tire mold having a circular central portion and mounted in a tire press, said apparatus comprising:

a supporting frame including a circular base adapted to sealably engage said tire mold;

a circular housing mounted on said supporting frame and adapted to concentrically overlie said tire mold to define an interior chamber, said housing spaced apart from said circular base to define therewith a continuous annulus passageway communicating with said interior chamber;

a closure member connected to said circular housing and adapted to sealably engage the central portion of said tire mold;

an abrasive applicator disposed within said interior chamber and having an abrasive discharge port;

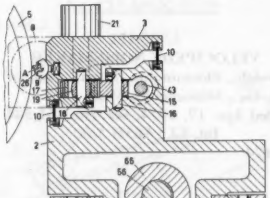
abrasive blast generating means for delivering cleaning abrasive to said abrasive applicator whereby said abrasive is discharged through said discharge port to strike the molding surface of said tire mold to dislodge vulcanization residue therefrom; and

vacuum means connected to said housing for drawing a vacuum on said interior chamber whereby air is pulled through said annulus passageway to sweep the molding surface and pick up abrasive discharged from said applicator and dislodged vulcanization residue.

3,905,156
THREAD GRINDING MACHINE WITH A DEVICE FOR THE RELIEF GRINDING OF THE THREADS ON TAP DRILLS AND INTERNAL THREAD FORMERS

Emil Vogelsanger, Dietlikon, Switzerland, assignor to Reishauer AG, Zurich, Switzerland

Filed Sept. 11, 1974, Ser. No. 505,057
Claims priority, application Switzerland, Sept. 17, 1973, 13301/73
Int. Cl.[2] **B24B** *3/22, 3/24*
U.S. Cl. 51—46 **13 Claims**



1. A thread grinding machine with a device for the relief grinding of the thread on thread boring devices and internal thread formers in which the rotating work-piece is positioned coaxially with the axis of the work-piece spindle on a work-piece carriage comprising:

a grinding disk assembly mounted on the machine movable radially with reference to the work-piece and parallel to the axis of the work-piece;

a work-piece carriage including an upper portion and a base portion, which are relatively movable to each other;

means for rotatably supporting a work-piece on said upper portion;

means interconnecting said upper and base portions, said interconnecting means comprising yieldable guide means which extend between said upper and base portions in a manner to position said upper and base portions in spaced relation to each other and to guide said upper portion in its movement with respect to said base portion and thereby reduce friction and wear on said base portion; and

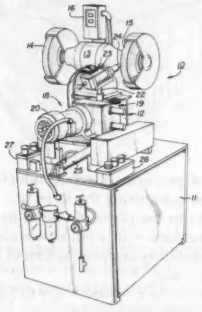
control means for displacing said upper portion with respect to said base portion including a rocking lever interconnecting said upper and base portions for controlling said displacement in accordance with the desired relief grinding movement.

3,905,157

GRINDING MACHINE FOR SHARPENING THE CUTTING EDGES OF A TOOL

Phillip A. Sollami, 438 Sherman St., Downers Grove, Ill. 60515

Filed June 27, 1974, Ser. No. 483,531
Int. Cl.[2] B24B *3/33*
U.S. Cl. 51—92 BS **10 Claims**



1. Grinding apparatus for sharpening a tool piece having a pair of cutting edges respectively defined by first and second surfaces on the tool piece, comprising

a rotatably driven grinding wheel having a peripheral grinding surface,

a carriage mounted for reciprocal, rectilinear movement toward and away from said wheel,

drive means for controllably moving said carriage in a first direction toward said wheel into a grinding position and in a second direction away from said wheel into a loading position,

reciprocal traversing means mounted by said carriage for reciprocal movement between two set positions in a direction traverse to the direction of movement of said carriage,

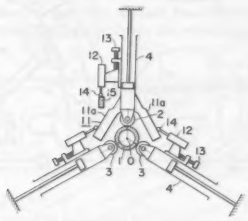
a tool piece holder rotatably carried by said reciprocating means for holding the tool piece to be sharpened in each of two angularly displaced positions against said grinding surface when said carriage is in a grinding position, and control means operating said drive means to move said carriage in said first direction to urge said tool piece against said grinding surface; operating said traversing means to move said tool piece back and forth between said set positions against said grinding surface to grind said first surface; then operating said drive means to retract said carriage and said tool piece away from said wheel; then causing said tool piece holder to rotate through a predetermined angle; then operating said drive means again to move said carriage in said first direction toward said wheel to urge said second surface of said tool piece against said grinding surface; operating said traversing means to move said tool piece between said two set positions back and forth across said grinding surface to grind said second surface; and then operating said drive means to retract said carriage and said tool piece away from said wheel.

3,905,158

MACHINE TOOLS

Yoshimi Ashizawa, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1974, Ser. No. 448,386
Int. Cl.[2] B24B *5/00, 7/00*
U.S. Cl. 51—89 **4 Claims**



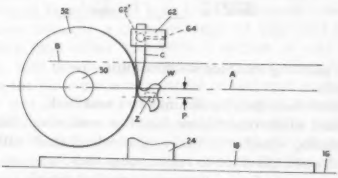
1. In a machine tool of the type wherein a plurality of tools which are arranged about the axis of a rotary workpiece at an equal angular spacing are advanced or retracted by the same distance toward and away from said axis, the improvement which comprises a synchronizing templet connected to one of the tools, said templet having reference surfaces which intersect at the same angle with a line along which said one tool is moved, styluses mounted on the other tools for engaging said reference surfaces, respectively, and hydraulic rams operatively coupled to said other tools and said styluses and controlled by the engagement of said styluses on said other tools with said reference surfaces for advancing or retracting said other tools by the same distance as said one tool.

3,905,159

TOOL-GRINDING GUIDE AND PROTECTOR ASSEMBLY

Kenneth P. Stanaback, 3640 Breton Rd., Grand Rapids, Mich. 49501

Filed Jan. 21, 1974, Ser. No. 435,260
Int. Cl.[2] B24B *3/12, 55/06*
U.S. Cl. 51—95 LH **6 Claims**



5. The assembly in claim **4** including exhaust hose coupling means and light-source-mounting means on said extension.

3,905,160

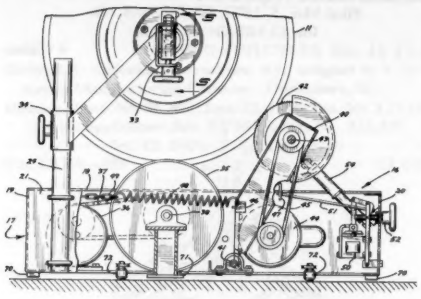
TIRE CONDITIONING APPARATUS

John D. McKenney, South Laguna, Calif., assignor to Royal Industries, Inc., Osseo, Minn.

Filed Apr. 26, 1973, Ser. No. 354,652
Int. Cl. B24b *5/00, 29/00, 1/00*
U.S. Cl. 51—106 R **10 Claims**

1. An apparatus for conditioning a tire mounted on a wheel that is rotatably mounted on an axle of a vehicle comprising in combination; means operable to rotate a wheel and tire on a vehicular mounted axle; a source of signal indicative of the

spindle hop of said axle in excess of a predetermined value; and grinding means operable in response to said signal for



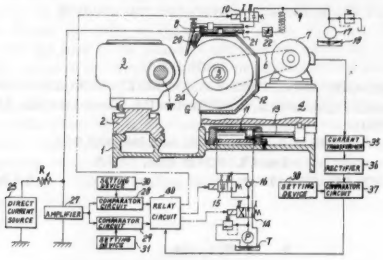
selectively grinding portions of the tread of a tire mounted on said axle.

3,905,161

GRINDING MACHINE WITH FEED RATE CHANGING APPARATUS

Tamaki Tomita, Okazaki, and Hayashi Kodama, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed May 20, 1974, Ser. No. 471,559
Claims priority, application Japan, May 24, 1973, 48-58151
Int. Cl.[2] B24B *49/08*
U.S. Cl. 51—165.77 **15 Claims**



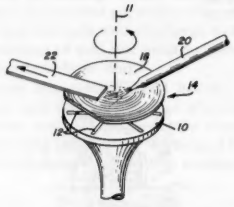
1. A grinding machine comprising:
a bed;
a wheel slide slidably mounted on said bed;
a wheel shaft rotatably mounted on said wheel slide;
a grinding wheel attached to said wheel shaft with electrically non-conductive relationship therebetween;
a drive motor for rotating said grinding wheel;
a work table slidably mounted on said bed for supporting a workpiece;
feed means for moving said wheel slide toward and away from said workpiece;
an electric power source;
electrode means mounted adjacent to said grinding wheel and connected to said electric power source for generating a difference of potential by creating an electric condenser between said grinding wheel and said workpiece; coolant means for connecting said electrode means and said grinding wheel so as to charge said grinding wheel by creating a coolant layer thereon;
detecting means for detecting the change of the difference of potential caused by engagement between said coolant layer on said grinding wheel and said workpiece to generate a control signal; and
control means for controlling said feed means so as to change the feed rate of said wheel slide in accordance with said control signal.

3,905,162

METHOD OF PREPARING HIGH YIELD SEMICONDUCTOR WAFER

John E. Lawrence, Cupertino, and Jules C. Santoro, San Jose, both of Calif., assignors to Silicon Material, Inc., Mountain View, Calif.

Filed July 23, 1974, Ser. No. 490,999
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 SF **7 Claims**



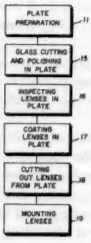
1. A method of preparing a semiconductor wafer prior to device fabrication comprising the steps of:
rotating a wafer in the plane of one of its faces;
wetting said one face with a liquid lubricant;
grinding a substantially circular pattern of lattice damage on said one face; and
polishing the other face of said wafer to form a substantially strain-free mirror-like surface.

3,905,163

LENS MAKING METHOD

Joseph P. Kleiber, Newark, N.Y., assignor to Tropel, Inc., Fairport, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,685
Int. Cl.[2] B24B *1/00, 13/02*
U.S. Cl. 51—284 **22 Claims**



1. A method of making lenses, said mehtod comprising:
a. forming solid, optical plates thicker than said lenses and having plane opposite face surfaces;
b. holding said plates relatively still;
c. moving tools relative to said fixed plates for cutting away annular grooves in one of said face surfaces of said plates to form any necessary clearance for subsequent tool motions;
d. moving tools relative to said fixed plates and within said annular grooves for cutting away material from said one face surfaces of said plates to form curved surfaces for said lenses, said curved surfaces being recessed relative to said one plane surface of said plate; and

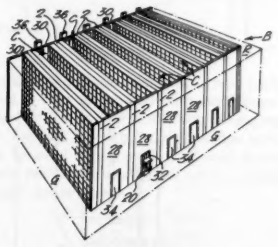
e. moving tools relative to said fixed plates and within said annular grooves for polishing said curved surfaces of said lenses.

3,905,164

STORAGE BUILDING STRUCTURE AND A CAB FOR MOVEMENT THEREIN

Philip Mandelbaum, 34 Fifeshire Rd. South, Toronto, Ontario, Canada

Filed June 6, 1973, Ser. No. 367,654
Claims priority, application United Kingdom, June 28, 1972, 30298/72
Int. Cl.[2] B66B 09/00; E04H 06/06
U.S. Cl. 52—30 6 Claims



1. A high capacity storage building comprising:

solid partitions within said building extending several stories in height between ground and roof levels and dividing the interior of said building into individual storage compartments, at least one pair of said partitions extending from one side of the building to an opposite side thereof being disposed in neighboring and substantially parallel, spaced, relation defining between then a storage compartment as aforesaid with a wide aisle and an intermediate corridor;

rods imbedded in each said partition substantially over its entire area in regularly spaced relation both in vertical and horizontal alignments, the rods on each said partition extending conterminously into the proximal portion of the said aisle to the edges of said corridor;

shelving supported on said horizontally aligned rods for the storage of goods;

standards interconnecting some of said vertically aligned rods, being anchored at the said ground and roof levels buttressing each said partition;

roofing over said neighboring partitions, a cab movable both horizontally and vertically in said corridor to provide access to said shelving on each said partition, and means for moving said cab both horizontally and vertically as aforesaid.

3,905,165

ROOF FLASHINGS FOR USE WITH ROOF PLANKING

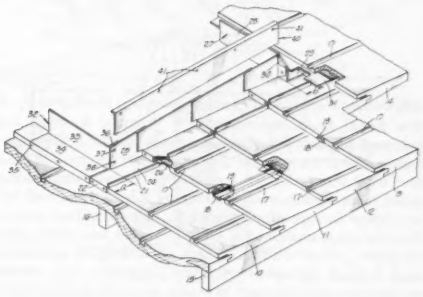
Joseph P. Kneisel, 3920 El Lado Dr., La Crescenta, Calif. 91214

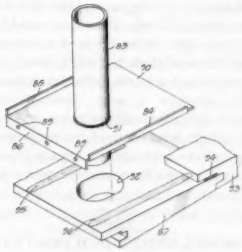
Continuation of Ser. No. 101,982, Feb. 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 885,148, Dec. 15, 1969, Pat. No. 3,626,439. This application July 5, 1973, Ser. No. 376,597
Int. Cl. E04d 3/38, 1/36
U.S. Cl. 52—58 5 Claims

1. A weatherproof joint of the type forming a seal at a roofing intersection of at least one length of roof planking and a member such as a chimney, vent or dormer or between intersecting ends of said lengths such as peaks, valleys, or hips wherein the improvement comprises:

at least one length of roof planking having a relatively smooth upper surface having upper and lower edges extending downwardly from its upper surface and having a deformable member positioned adjacent its lower surface and near the lower edge thereof;

at least one flashing member affixed to said length of roof planking, said flashing member having an upper and lower edge, a pair of side edges and at least one flat roof-mating surface positioned against the upper surface of said planking, at least one upwardly extending vertical reinforcing section adjacent a side edge of said roof-mating surface said verticle section being formed from the same piece of material as said roof-mating surface and being terminated away from the roof-mating surface of





said flashing member, said upper edge of said flashing abutting said deformable member and forming a weather tight seal therewith, at least one downwardly extending section adjacent a different edge of said roof-mating surface than either said vertical section or said upper edge, said downwardly extending section being formed from the same piece of material as said roof-mating surface and attachment means affixed to said downwardly extending section to hold said downwardly extending section to said lower edge of said length of roof planking and to hold the upper edge of said flashing member against said deformable member.

3,905,166

ROTATABLE BUILDING STRUCTURE

Heinz W. Kaiser, Rt. 1, Box 248, Eugene, Oreg. 97404

Filed May 6, 1974, Ser. No. 467,404
Int. Cl.[2] E04B 1/346
U.S. Cl. 52—65 8 Claims

1. A rotatable building structure supported by a stationary base including rigid support means, said building comprising in combination,

a floor structure including radially disposed trusses,

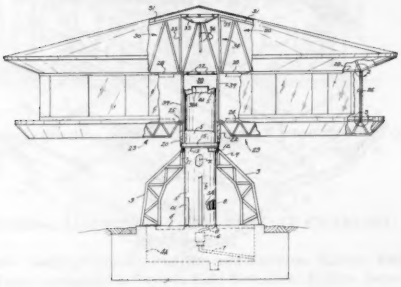
a roof structure including radially disposed trusses,

tension rods extending intermediate said floor and roof structures interconnecting outer end segments of the roof and floor trusses, means coupling the tension rod ends to the floor and roof trusses in a manner permitting limited

arcuate movement therebetween to facilitate the transfer of floor loads to the roof structure,

an upright core structure centrally located within the building structure supporting the inner ends of said floor and roof structures, the inner ends of the floor trusses being supported by said core structure in a manner permitting floor loads to be carried by said tension rods,

bearing means including inner and outer races relative to the rotational axis of the building and cooperatively supporting the rotatable building structure with one of said races associated with said core structure and the inner ends of the radially disposed floor trusses,



said tension rods serving to transfer floor loads to the rigid roof structure whereby the transferred loads will result in downward axial loads on said core structure and said bearing means while subsantially avoiding the undesirable imparting of radial loads to the bearing means by the floor structure, and

an access housing depending from and rotatable with the core structure, said access housing projecting through the bearing races, said access housing permitting vertical ingress and egress from the rotatable building structure.

3,905,167

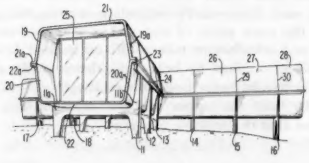
MODULARIZED BUILDING SYSTEM

Berne A. Watkins, 76 Cambridge Rd., Glenmont, N.Y. 12077, and James Sedore, 11 Jason St., Pittsfield, Mass. 01201

Filed Nov. 9, 1973, Ser. No. 414,480

Int. Cl.[2] E04H *1/12*

U.S. Cl. 52—79 **1 Claim**



1. A building formed of a plurality of modular units comprising:

each said modular unit being formed of two substantially identical modular elements which are of U-shaped cross-section, each said U-shaped element having depending opposed sidewalls corresponding to the legs of the U which terminate in longitudinally extending flange portions, said two modular elements being assembled in opposing relation with their corresponding flanges in abutting relation and with means for securing said abutting flanges,

and support means for each said modular unit comprising at least one member defining a generally U-shaped recess for supporting on its bight portion the bight portion of the lowermost of said U-shaped modular elements and with the upstanding leg portions of said member extending upwardly on opposite sides of said lowermost element to support said flange joining the juxtaposed modular elements.

3,905,168

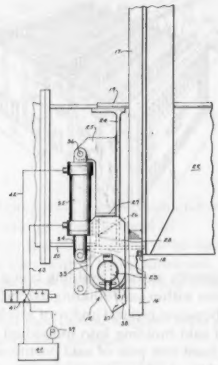
MAST LOCKING MECHANISM

Jack D. Nelmark, New Berlin, and Matthew Smith, Milwaukee, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Mar. 20, 1974, Ser. No. 452,730

Int. Cl.[2] E04H *12/34*

U.S. Cl. 52—116 **3 Claims**



1. In a mast locking mechanism for a drilling apparatus having a machinery platform and a tiltable mast on the platform that turns about a pivot axis into a raised drilling position, the combination comprising:

a catch member and a latch member, one of which is mounted on said platform and the other of which is mounted on said mast, and which are brought into alignment with one another upon pivot of said mast into a raised drilling position;

an actuator for moving one of said catch and latch members into and out of engagement with the other member upon bringing said members into alignment with one another;

said catch member having a tapered slot that receives said latch member;

said latch member being tapered and having an oblique face that engages and mates with said tapered slot with a wedging fit that presents a force component transverse to said pivot axis of said mast for holding said mast in tight engagement with said platform.

3,905,169

CRYPT FRONT REMOVABLE MOUNTING MEANS

Roberto A. Gallo, 2468 Wiley St., Hollywood, Fla. 33020

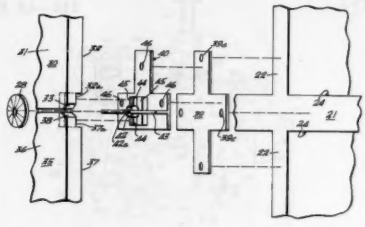
Filed Dec. 3, 1973, Ser. No. 421,252

Int. Cl. E04b *1/40;* **E04c** *1/00*

U.S. Cl. 52—137 **7 Claims**

1. Mountings for individually removable fronts of a vertical wall of a mausoleum structure compartmented by vertical and horizontal concrete partitions into rows and vertical tiers of individual crypts, said fronts having rear surface corner areas precut to provide a uniform thickness thereat, each of said mountings comprising a backing plate embedded in a layer of cement applied to said structure at an intersection of said partitions, each backing plate having an exposed flat surface aligned in a common predetermined vertical plane a bracket having a flat body portion lying flat against said exposed sur-

face of each of said backing plates, fastening means extending through said body portion and backing plate into said structure to anchor the bracket to said structure, said bracket having a horizontal ledge extending at right angles to said body portion for supporting a bottom edge of one of said fronts, a shoulder projecting a predetermined distance from



said body portion to engage said precut rear surface area of the front, and a boss associated with said ledge having an internally threaded bore for removably engaging a rosette center screw therein, whereby said shoulder serves to positively align a forward facing surface of said front in a plane parallel to said predetermined plane when a rosette is tightened by its said center screw.

3,905,170

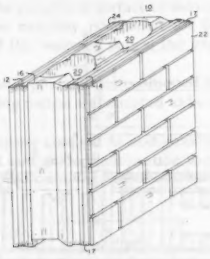
BUILDING WALL UNIT

Erik W. Huettemann, 15 Mill Rd., Madison, Ala. 35758

Filed Feb. 25, 1974, Ser. No. 445,818

Int. Cl.[2] E04C *1/10*

U.S. Cl. 52—593 **10 Claims**



1. A rectangular wall unit for building construction having two opposite face sides and four interconnecting edge sides comprising:

a composition comprising:

a cured mineral bonding material of hydrated lime and silica flour and wherein:

the ratio, by volume, of hydrated lime to the sum of hydrated lime and silica flour of said bonding material is .4 to .6, and where the ratio, by volume, of constituents is within the range of one part bonding material to one to four parts aggregate and applied water is 7 to 12 percent;

a lightweight aggregate having a density of .08 to .6 and comprising at least one of the following:

styrofoam, pumice, perlite, vermiculite, glass nodules, or puffed-up ceramic;

said edge sides of said unit are of tongue and groove configuration, with one of each two parallel edge sides having at least a tongue-shaped protrusion and the other having a complementary groove, and

at least one cavity extending between a pair of opposite edge sides of said unit.

3,905,171

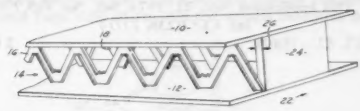
BUILDING PANELS

Don A. Cargill, 822 Fairfax, Birmingham, Mich. 48009; Paul M. Corp, 850 Lone Pine Rd., and Lloyd M. Forster, 1624 Lochridge Rd., both of Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 229,786, Feb. 28, 1972, abandoned. This application Feb. 9, 1973, Ser. No. 331,193

Int. Cl. E04b *2/32*

U.S. Cl. 52—615 **10 Claims**



1. A structural composite panel comprising a penetrable panel sheet, a plurality of intermediate sheet metal web means, apices of said web means including integral fastening prongs penetrating the panel face, and chordal tensile means engaging other apices of said web means spaced from said panel face, each of said web means comprising a sheet metal stamping having a series of longitudinally spaced apices extending along one edge extremity, a complementary series of intermediate longitudinally spaced apices extending along an opposite edge extremity, angularly extending flanged strut portions joining alternate apices of opposite edges to form an integral continuous zig-zag web means said truss means having an edge adapted attached to said penetrable panel sheet extending normal to said web means characterized by integrally formed pairs of asymmetrical prongs extending substantially in the plane of said sheet metal producing opposite bending movement toward each other in the plane of said prong in penetrating said adjoining element, the bases of each pair of prongs being substantially spaced with an intermediate straight edge portion engaging the adjacent surface of and limiting prong penetration into said adjoining elment and locking each pair of prongs of said web means to a substantial mass of said adjoining element, said web means having a complementary configuration adapted for progressive multiple truss stampings from a single metal sheet substantially free of intermediate scrap blanking material.

3,905,172

METHOD OF LAYING WOODEN FLOORS

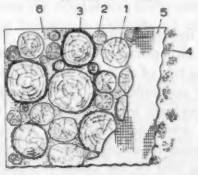
Jack Blackburn, 103 Portland Rd., Birmingham, England

Filed Nov. 12, 1973, Ser. No. 414,684

Claims priority, application United Kingdom, Nov. 13, 1972, 52215/72; Sept. 6, 1973, 41940/73

Int. Cl.[2] B32B *3/10, 5/16, 21/02*

U.S. Cl. 52—741 **6 Claims**



1. A method of laying a wooden floor on a solid base comprising securing together lengths of timber in a vertical bundle by bands, pouring a liquid adhesive into the top of said bundle to fill the gaps between the lengths of timber, and, when said adhesive has hardened, removing said bands and cutting the bundle transversely into slices, each slice exposing a group of end cuts; placing said slices of timber on said base; applying an adhesive to fill up gaps between said slices; and when the

adhesive has hardened, polishing the surface of the floor to even out surface irregularities and expose the cross grain of the timber.

3,905,173

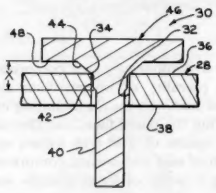
RESISTANCE-WELDABLE STUD

John M. Gerken, Chagrin Falls, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 363,889, May 25, 1974, abandoned. This application Nov. 21, 1974, Ser. No. 525,770

Int. Cl.[2] B23K *11/14*

U.S. Cl. 52—758 B **2 Claims**



1. In combination, a plate of a fixed thickness having a hole with a circular cross section therein, a resistance-weldable stud to be resistance welded in the hole, said stud having a shank of substantially uniform transverse cross section throughout its length and of generally cylindrical configuration, an enlargement at one end of said shank of cylindrical configuration and structurally integral with said shank, the diameter of said enlargement being more than that of said shank and less than the diameter of said hole, a beveled portion at the end of said enlargement opposite said shank, and a head extending outwardly from said beveled portion at the end opposite said enlargement, said head having a circular configuration in a plane perpendicular to said shank, the distance from the surface of said head adjacent said beveled portion to the end of said enlargement adjacent said shank not exceeding the thickness of said plate.

3,905,174

MANUALLY MANIPULATED APPARATUS AND METHOD OF PERIPHERALLY SECURING A PLASTIC COVER TO A RIMMED OPEN TOP CONTAINER

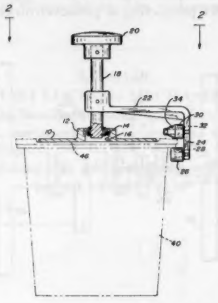
Raymond Heisler, 657 Dakota Trl., Franklin Lakes, N.J. 07417

Division of Ser. No. 426,337, Dec. 19, 1973. This application Dec. 13, 1974, Ser. No. 532,493

Int. Cl. B65B *7/28*

U.S. Cl. 53—38 **8 Claims**

1. Apparatus for manually securing a downwardly turned U-shaped outer rim portion of a cover onto the outwardly extending mating rim of an open top container so as to mount the cover on the container rim, the manual apparatus including: (a) a support arm including a freely turning first roller carried by said arm and selectively movable to a position where it is adapted to engage the undersurface of the outwardly extending rim of the container and in association to locally support the rim during a cover applying sequence; (b) a freely-turning second roller also carried by a support arm, this second roller supported so that its periphery engages a U-shaped rim portion of the cover and in applying position is so spaced from the first roller that a determined local seating pressure is applied to the cover rim to cause a local seating of the container rim to be achieved; (c) means for moving said rollers to achieve simultaneous relative movement of the support arm and the container and cover so that the support and the applying rollers are moved circumferentially around the container rim and cover rim to sequentially press the U-shaped rim portion of the cover in a seated condition on the



rim of the container, and (d) means for removing the manual applying apparatus from the container and its mounted cover.

3,905,175

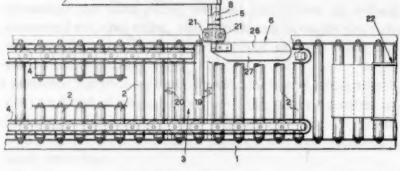
DEVICE FOR CLOSING THE REAR FLAP OF A PARALLELEPIPED BOX

Augusto Marchetti, Piazza Sicilia, 7, Milan, Italy

Filed Apr. 9, 1974, Ser. No. 459,278

Int. Cl.[2] B65B *57/02, 7/20*

U.S. Cl. 53—76 **6 Claims**

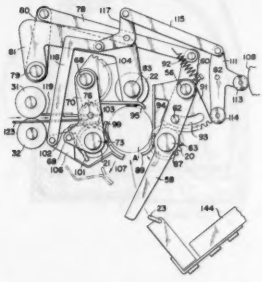


1. Device for closing the rear flap of a parallelepiped box, comprising a support surface along which the box is made to advance, an axially translatable and rotatable shaft disposed on one side of said support surface and directed transverse to the path of advancement of the box, a rod fixed perpendicularly to that end of the shaft nearer said support surface, control means operable after the box has advanced beyond the shaft in order to cause the axial movement of said shaft from a retracted position in which said rod is outside the path of advancement of the box to an extended position in which said rod is inserted into the path of advancement of the box, and guide means for transforming at least the last part of said axial movement of the shaft into a helical movement which enables said rod to rotate simultaneously about the axis of the shaft from a first position in which it is directed towards the inlet end of the support surface to a second position in which it is directed towards the exit end of the support surface, passing through a succession of intermediate positions in which said rod engages from below with the rear flap of the box and bends it over into the closure position.

3,905,176
COIN WRAPPING APPARATUS

Masatoshi Ushio, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jan. 16, 1974, Ser. No. 433,891
Claims priority, application Japan, Jan. 23, 1973, 48-10067
Int. Cl.² B65B *11/04*
U.S. Cl. 53—212 **3 Claims**



1. In a coin wrapping apparatus comprising a plurality of wrapping rolls arranged around a space for receiving a stack of coins of a predetermined number and denomination, at least one of said wrapping rolls being adapted to be advanced toward said space to contact and rotate the coin stack introduced into the space and separated therefrom for the introduction and discharge of the stack of coins, means for feeding a piece of wrapping paper, a plurality of guide plates for guiding the wrapping paper thus fed between the stack of coins and the plurality of wrapping rolls to thereby wrap the paper around the peripheral surface of the coin stack, and fold crimping means movably positioned for fold crimping the lateral edges of the wrapped paper, the improvement which comprise:

a portion of said guide plates positioned in the path of said fold crimping means and adapted to be retractable therefrom; and

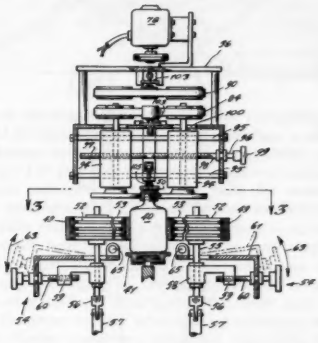
means operatively coupled to said guide plates for retracting at least said guide plate portion to unblock said path when said fold crimping means are moved into crimping position.

3,905,177
BOTTLE CAPPING MACHINE

Michael Herzog, 3615 Woolworth Bldg., Brooklyn, N.Y. 10007

Filed Oct. 29, 1973, Ser. No. 410,911
Int. Cl.² B67B *3/20*
U.S. Cl. 53—314 **5 Claims**

1. A bottle capping machine comprising a cap feeding mechanism, a bottle conveying belt, a bottle grasping mechanism and a cap tightening mechanism, wherein said conveying belt and mechanisms are synchronized to effect sequentially placement of a cap on each bottle as the belt moves in one direction, followed by simultaneous grasping of the bottle by the grasping mechanism and tightening of the cap by the tightening mechanism, said cap feeding mechanism comprising an inclined cap chute having upper and lower end aligned with the bottles and feeding a cap onto the top of each bottle in successive order, said chute comprising a pair of laterally spaced members secured together with transversly adjustable means whereby the width of the chute may be adjusted for different cap sizes, said chute being pivoted at said upper end and secured adjacent said lower end by a cam rotatable about an off-center axis transverse to said chute, whereby rotation of said cam will vary the elevation of said chute to accommodate bottles of varying heights, wherein said chute includes an adjustable holder at its lower end for feeding caps to the tops of the bottles, said bottle grasping mechanism comprising a pair of parallel endless belts disposed on opposite sides of the bottle including rollers engaging said belts, pressing said belts into grasping contact with said bottles preventing rotation of said bottles, said rollers being secured to spaced shafts, wherein said cap tightening mechanism comprises pairs of parallel shafts having tightening wheels mounted thereon in contact with the bottle caps on the bottles including means for rotating the shaft with the wheels mounted thereon, whereby the wheels rotate in the same direction causing tightening of the bottle caps, said shafts with the wheels mounted thereon



being rotatably mounted in adjustable blocks including means for moving the blocks towards and away from each other, thereby adjusting the space between the said wheels whereby the said spaced shafts having said rollers mounted thereon engaging said belts are mounted on bearings adjustable in a direction transverse to the movement of the conveyor belt, said bearings being mounted on plates pivotable about an axis parallel to the conveyor belt movement whereby said bearings and rollers may be adjusted transversely toward and away from each other and also inclined relative to each other by pivoting the said plates about said axis parallel to the conveyor belt movement.

3,905,178
AUTOMATIC CONTAINER CAPPING AND DISPENSING DEVICE

John Barth West, Box 187, Glyndon, Md. 21071

Continuation-in-part of Ser. No. 390,243, Aug. 21, 1973, Pat. No. 3,864,898. This application Dec. 24, 1974, Ser. No. 536,103
Int. Cl.² B65B *7/28;* **B67B** *3/00*
U.S. Cl. 53—328 **9 Claims**

6. Capping means for containers comprising:

magazine means holding a plurality of container lids in a substantially vertical stack with each said lid disposed substantially horizontally;

holding means for positioning an open mouthed container beneath said magazine means with the open mouth of said container in registry with said stack of lids;

annular bearing means having outer and inner peripheries mounting said magazine for reciprocation on its longitudinal axis toward and away from said holding means within the inner periphery of said bearing means;

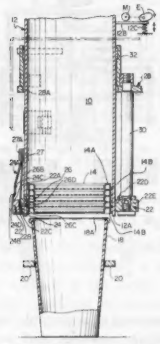
said lids and the mouth of said container having conformally shaped coacting rim structures to effect a force fit therebetween; and

lid retaining and release means cooperating with said magazine and synchronized with the reciprocations thereof releasing the lowermost lid in said stack and retaining the remainder of said lids therein as said magazine approaches said container and subsequently applying a substantially vertical force to said rim structure of said

lowermost lid to effect said force fit of said lid to said container;

said lid retaining and release means comprising detent means selectively extending inboard of said magazine means beneath said lowermost lid in said stack and clamping means selectively engageable with a plurality of said lids to retain all but the lowermost of said lids in said magazine;

said annular bearing means including spaced outer and inner cam means in registry at selected positions about said outer and inner peripheries of said bearing means;



said detent means and clamping means being mounted, respectively, on first and second leaf spring follower arms cantilevered at common mounting points for each cooperating pair of detent and clamping means corresponding to said selected positions of said spaced outer and inner cam means; and

said first and second leaf spring follower arms including rise and dwell surfaces sequentially engaging said outer and inner cam means, respectively, on said annular bearing means during reciprocation of said magazine means.

3,905,179

STIRRUP

Lorenz Bischeltsrieder, Furstenfeldbruck, Germany, assignor to Stubben GmbH, Riding Equipment, Stans, Switzerland

Continuation of Ser. No. 255,219, May 19, 1972, abandoned.

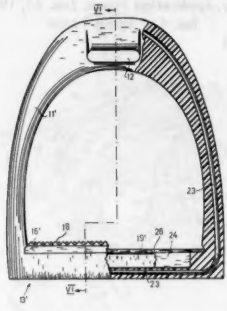
This application July 16, 1973, Ser. No. 379,453

Claims priority, application Germany, May 21, 1971, 2125332

Int. Cl.[2] B68C *3/00*

U.S. Cl. 54—47 **12 Claims**

1. A stirrup, comprising: a one-piece body member of plastic material which has spaced legs, a footrest extending transversely between said legs, and an eye through which a stirrup leather can be trained, said eye being located at one end of said stirrup and said footrest being located at the opposite end thereof; and a separate loading means made of a material of higher density than said plastic for increasing the total weight of the stirrup and for displacing the center of gravity of said



stirrup toward the footrest, said loading means being fixed in or to said footrest.

3,905,180

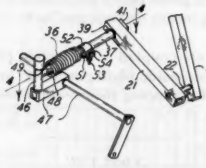
TORSION SPRING COUNTERBALANCE FOR A LAWN MOWER

Sahag C. Akgulian, Racine; Donald G. Haffner, Glendale, and Dean A. Meyer, Caledonia, all of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed Sept. 12, 1974, Ser. No. 505,266

Int. Cl.[2] A01D *75/30*

U.S. Cl. 56—7 **4 Claims**



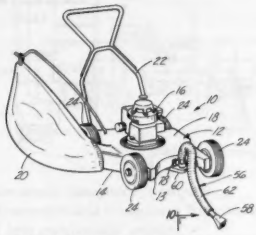
1. In a lawn mower mounting on a tractor, a lawn mower, a pivot mounting for pivotally attaching said lawn mower to said tractor and including two mating pieces axially extending in the fore-and-aft direction of said tractor, with one of said pieces being oriented relative to said tractor and the other of said pieces being rotatable about its longitudinal axis relative to said tractor, said other of said pieces being affixed to said lawn mower for unitary pivotal action of said mower and said other of said pieces, a drive mechanism on one end of said lawn mower offset from the plane of the longitudinal axis of said mating pieces and over-balancing said lawn mower toward its said one end, a spring operatively connected between said tractor and said lawn mower for countering the over-balance of said lawn mower, the improvement comprising said spring being a torsion spring concentric on said two mating pieces and extending therealong, said other of said two mating pieces axially extending beyond said one of said mating pieces and with said torsion spring having its opposite ends respectively anchored to said two pieces, and with said torsion spring being coiled in the direction to exert a spring force on said other of said two pieces and thereby on said lawn mower to counterbalance the weight of said drive mechanism.

3,905,181

LAWN MAINTENANCE EQUIPMENT

Carlton E. Messner, 1445 Randolph, Muskegon, Mich. 49441

Filed Feb. 4, 1974, Ser. No. 439,385
Int. Cl.[2] A01D 35/262
U.S. Cl. 56—13.1 19 Claims



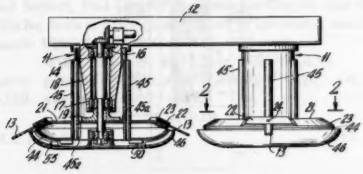
10. Lawn maintenance equipment comprising a housing having a front wall, a rear wall and a top wall, sidewalls, a bottom inlet for air and vegetation and a discharge chute disposed in the upper part of one of said walls, a power driven, generally vertically disposed shaft within said housing, a cutting blade mounted to said shaft in a horizontal plane disposed below said discharge chute, a fan blade fixed to said shaft above said cutting blade to rotate at the same speed as said cutting blade, a baffle mounted to said housing and extending from said front wall generally horizontally between said cutting blade and said fan blade, said baffle being adapted to effect an increase in the rate of air flow and to direct said air flow torroidally in said housing.

3,905,182

ROTARY MOWER

Horst W. Geier, 18 Hawley Ter., Yonkers, N.Y. 10701

Filed Feb. 13, 1974, Ser. No. 442,230
Int. Cl. A01d 55/18
U.S. Cl. 56—13.6 19 Claims



1. In a rotary mower, the combination comprising:

a mower body rotatable about a generally vertical axis; including a generally vertical cylinder in the center thereof,

a collar portion fixed to the bottom of said cylinder,

a plurality of protective housings located about the periphery of the collar portion and a cutting knife mounted in each housing, said knives being rotatable about their mounting upon striking an object and said mountings being protected on the upper and lower surfaces by the housings, and

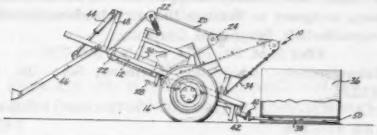
a freely rotatable protective saucer mounted to the mower body at the lower end thereof at a predetermined distance from the collar portion.

3,905,183

ASPARAGUS HARVESTER RECEIVING BIN REMOVAL & SUPPORT MEANS

Paul J. Moore, and Archie E. Neal, both of Garfield, Wash., assignors to J. E. Love Company, Garfield, Wash.

Filed Apr. 29, 1974, Ser. No. 465,094
Int. Cl.[2] A01D 45/00
U.S. Cl. 56—327 A 5 Claims



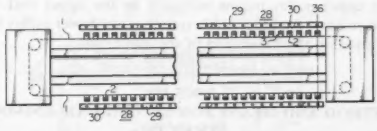
1. In an asparagus harvesting machine comprising a frame mounted for movement over a ground surface, a plurality of paired gripper belts mounted for movement within said frame and adapted to grip growing asparagus spears, a cutting blade positioned subjacent said gripper belts for severing said gripped asparagus spears, conveyor means located below said gripper belts rearwardly of said cutting blade at a point where said gripper belts release said cut asparagus spears and adapted to carry said released asparagus spears upwardly, there being a receiving bin disposed rearwardly of said frame for receiving said cut asparagus spears from said conveyor means, the improvement wherein said asparagus harvesting machine further comprises elongated, essentially horizontal support means projecting rearwardly from said frame, self-bracing hinging means connecting said support means to said frame and adapted to permit said projecting support means to pivot freely upwardly from an essentially horizontal position relative to said frame yet prevent pivotal movement by said support means below said essentially horizontal position, lifting means disposed at the forward end of said frame for raising the forward end of said harvesting machine frame upwardly and lowering said rearwardly projecting support means toward the ground surface, said receiving bin being carried on said rearwardly projecting support means with the bottom portion of said receiving bin having channel means sized and shaped to receive said rearwardly projecting support means.

3,905,184

APPARATUS FOR SIMULTANEOUSLY DOFFING AND DONNING APPARATUS

Satoshi Takai, Nishikasugai; Seiji Izutsu; Shigenobu Iida, both of Nagoya, and Osamu Terao, Yokkaichi, all of Japan, assignors to Howa Kogyo Kabushiki Kaisha, Japan

Filed Feb. 5, 1974, Ser. No. 439,936
Int. Cl.[2] D01H 9/08
U.S. Cl. 57—52 6 Claims



1. In a simultaneous doffing and donning apparatus usable for textile machines, such as a ring spinning frame, the combination comprising:

a conveyer mechanism including a conveyer member (1) movable along the sides of the frame and parallel to a row of spindles (37), on which conveyer member a row of pegs (2) are disposed and are spaced longitudinally along said member, their pitch being equal to the spindle pitch; an auxiliary peg apparatus (28) arranged parallel to the

row of pegs (2) on the conveyer member (1), and movable horizontally so as to change the distance between the row of pegs and the row of auxiliary pegs (30), i.e., the closest position being the ready position and the outermost position being the operating position.

3,905,185

APPARATUS FOR APPLYING THREADS ON HEATING SYSTEMS OF TEXTILE MACHINES

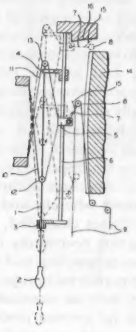
Karl Bauer, and Herbert Streppel, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Sept. 20, 1974, Ser. No. 507,778

Claims priority, application Germany, Sept. 26, 1973, 2348322

Int. Cl.[2] D02G *1/02;* **D01H** *13/04;* **D02J** *13/00;* **F26B** *19/00*

U.S. Cl. 57—106 **3 Claims**



1. Thread-applying apparatus for heating systems used on textile treating machines such as false-twist machines for the false-twist texturizing of threads of synthetic polymers and embodying heating devices across or through which the thread runs in a substantially vertical or a vertically diagonal direction and at least the upper end of which is above the manual reach or tending height, which thread-applying apparatus comprises a substantially vertically slidable hand rod and a thread-applying guide movably mounted by guide means for movement of the rod and guide up and down substantially parallel to the heating device between a lower tending position, in which the thread is applied, and an upper operating position, in which the thread runs in contact with the heating device, the thread-applying guide being mounted on a slide member, said slide member being mounted on the rod or a separate, substantially vertical guide member for up and down movement adjacent the heating device, two cables respectively fixedly secured at one end and the other end of each being fastened to the slide member, and one cable running over upper pulley means mounted on the upper part of the hand rod and the other cable running over lower pulley means mounted on the lower part of the hand rod.

3,905,186

METHOD AND MEANS FOR CONTROL OF END-DOWN SERVICING

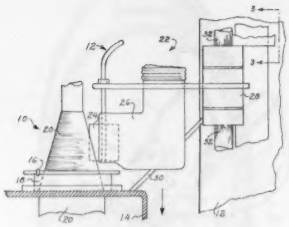
Albert D. Harmon, Clemson; Charles R. Martin, Seneca, and William H. Drake, Greenville, all of S.C., assignors to Saco-Lowell Corporation, Easley, S.C.

Filed Oct. 23, 1973, Ser. No. 408,780

Int. Cl.[2] D01H *15/00*

U.S. Cl. 57—34 R **18 Claims**

1. In the automatic end-down servicing of a textile spinning machine having a bobbin-yarn package encircled by a spinning ring carried by a ring rail vertically movable during operation of the spinning machine through reciprocatory traverses, each servicing operation including rotating the package in an unwinding direction while retrieving yarn from the package by yarn retrieving means movable vertically with the ring rail, the improvement comprising detecting reversals of the direction of movement of the ring rail of the spinning machine at oppo-



site ends of reciprocatory traverses thereof, initiating the yarn retrieving step of each piecing operation in response to a detected reversal of the direction of movement of the ring rail from upwardly to downwardly, and terminating the yarn retrieving step of each piecing operation in response to a detected reversal of the direction of movement of the ring rail from downwardly to upwardly.

3,905,187

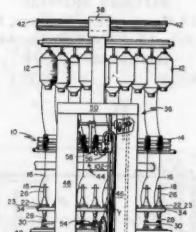
AUXILIARY YARN PIECING EQUIPMENT

Albert D. Harmon, Clemson; Charles R. Martin, Seneca, and Luther A. Cleland, Jr., Westminster, all of S.C., assignors to Saco-Lowell Corporation, Greenville, S.C.

Filed Jan. 23, 1974, Ser. No. 435,712

Int. Cl.[2] D01H *15/00*

U.S. Cl. 57—34 R **7 Claims**



1. Yarn piecing apparatus for supplying a free end of auxiliary yarn to a winding instrumentality onto which said free end is to be wound, said apparatus including

supply means for supplying auxiliary yarn from an auxiliary yarn source

air suction means for storing a substantial length of said free end of yarn

said supply means and said air suction means supporting said auxiliary yarn in a free yarn zone therebetween and release air jet means operable to provide a release jet of air in said free yarn zone for removing said free end of yarn from said air suction means and propelling it toward said winding instrumentality for winding therearound.

3,905,188

ELECTRONIC TIMEPIECE

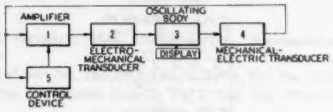
Yasuhiko Nishikubo, Iruma; Heihachiro Ebihara, Tokorozawa; Shingo Hashimoto, Tokyo, and Hiroyuki Fukayama, Kawasaki, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 2, 1974, Ser. No. 466,223

Claims priority, application Japan, May 24, 1973, 48-57208

Int. Cl.[2] C04C *3/00*

U.S. Cl. 58—23 R 5 Claims



1. An electronic timepiece, comprising:

an electromechanical transducer for converting an electric signal into mechanical energy;

an oscillating body connected to said mechanical transducer and driven by said mechanical energy to an amplitude dependent upon the energy of a signal applied to said transducer;

a mechanical-electrical transducer coupled to said oscillating body for generating an electric feedback signal having an amplitude corresponding to the displacement of said oscillating body;

a feedback amplifier responsive to said feedback signal and connected between said mechanical-electric transducer and said electro-mechanical transducer for applying an electrical signal to the latter, said amplifier having a variable bias;

a control circuit including a first amplifier means connected to said mechanical-electrical transducer by a differentiating means and energized by said feedback signal, said first amplifier means being connected to said feedback amplifier for varying said bias thereof, said amplifier and said control circuit being formed in a monolytic chip whereby the bias of the feedback amplifier is responsive to the differential of said feedback signal to control oscillation of the oscillating body.

3,905,189

MECHANICAL IMPROVEMENT ON AN ALARM CLOCK

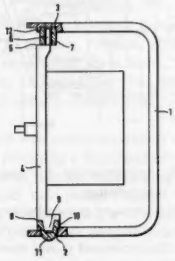
Roland Siefert, Bad Durrheim; Hans Seckinger, and Herbert Krösche, both of Schwenningen, all of Germany, assignors to Kienzle Uhrenfabriken G.m.b.H., Germany

Filed Mar. 29, 1974, Ser. No. 456,434

Claims priority, application Germany, Apr. 10, 1973, 7313388; Apr. 3, 1973, 7312473

Int. Cl.[2] G04B *37/14*

U.S. Cl. 58—56 12 Claims



1. An alarm clock comprising:

an open-end clock case; and

a plate on which the clock works are mounted and which is arranged to close said case, said clock case having further openings on one side thereof and at least one recess on the side opposite said further openings, said further openings and said recess being arranged to receive corresponding studs located on opposite sides of said plate, at least the outer surfaces of said studs being covered with an elastic material, the elastic surfaces of the studs being received in said further openings and protruding therethrough to form feet for the clock.

3,905,190

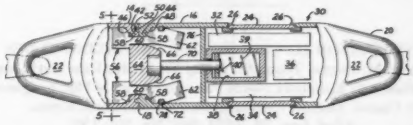
RELEASE MECHANISM FOR LARGE CHAIN

Michael D. Pearlman, 2342 Euclid Ave., El Cajon, Calif. 92021

Filed Oct. 30, 1974, Ser. No. 519,345

Int. Cl. F16g *15/04*

U.S. Cl. 59—93 18 Claims



1. A remotely actuable release mechanism adapted to interconnect two portions of a chain or the like and to separate said portions from one another while under high tension, said mechanism being adapted for underwater use and comprising:

a body having two mating sections with each of the sections being connected to one of said chain portions so that separation of said body sections separates said chain portions;

movable locking means contained in one of said body sections and movable between a first position locking said body sections together and a second position wherein said sections can be disconnected;

actuating means in said one body section adapted to move said locking means from said first to said second position in response to receiving a predetermined command signal.

3,905,191

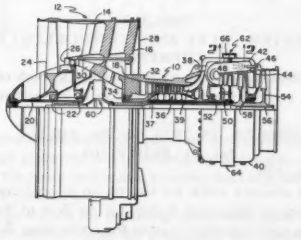
GAS TURBINE ENGINE WITH EFFICIENT ANNULAR BLEED MANIFOLD

Lawrence R. Matto, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Apr. 10, 1974, Ser. No. 459,703

Int. Cl.[2] F02C *3/12*

U.S. Cl. 60—39.07 6 Claims



1. A gas turbine engine comprising:

an annular outer housing;

a driven compressor journaled within said housing for pressurizing ambient air;

a combustor positioned within said housing downstream from said compressor and receiving the pressurized air therefrom;

means for injecting fuel into said combustor for producing a combustible mixture ignitable to produce a propulsive gas stream;

an annular bleed chamber positioned at said combustor around at least a portion of the periphery of said housing at a position experiencing the maximum pressure for air discharged from said compressor, said housing having openings connecting the interior of said housing to said annular bleed chamber, said annular bleed chamber is defined by a channel-shaped element extending around the periphery of said housing and terminating in ends defining a gap adjacent the bottom of said housing and said housing is imperforate in the area of said gap, thereby minimizing entry of raw fuel into said manifold; and

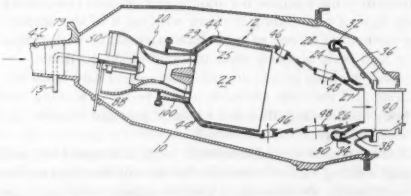
deflector means positioned over said openings so as to permit entry of air into said bleed chamber but deflect particulate matter away from said openings.

3,905,192

COMBUSTOR HAVING STAGED PREMIXING TUBES

Robert M. Pierce, Tequesta; Philip W. Smith, Lake Park, and Walter R. Kaminski, North Palm Beach, all of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 29, 1974, Ser. No. 501,739
Int. Cl.² F02C *7/22*
U.S. Cl. 60—39.71 **14 Claims**



1. In combination, a staged premixing tube for directing a mixed fuel-air flow into a burner, said staged premixing tube having an outer tube for receiving fuel and air, said outer tube having an inner tube located therein adjacent its rear end forming a first inner passage and a second annular passage therearound, said outer tube having a movable tube located therein forwardly of said inner tube, said movable tube being movable between a first position where it directs all of the flow in said outer tube through said first inner passage to a second position where all of the flow is directed through both of said first and second passages.

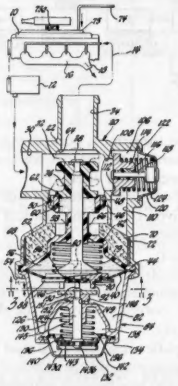
3,905,193

AIR DIVERTER VALVE AND CONTROLLING MEANS THEREFOR

Gerald D. Heilman, and Gordon R. Paddock, both of Rochester, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1974, Ser. No. 445,114
Int. Cl.² F02B *75/10*
U.S. Cl. 60—290 **3 Claims**

1. An air diverter valve for use on an intenal combustion engine having an induction system for air flow to the engine, a throttle in said induction system for controlling flow therethrough, an exhaust system, and an engine driven positive displacement air pump for supplying air to said exhaust system, said valve comprising a housing having an inlet adapted for receiving air from said pump and an outlet adapted for delivering air to said exhaust system, said housing further having a vent aperture between said inlet and said outlet, said vent aperture opening to the atmosphere, valve means associated with said outlet and said vent aperture and movable therebetween, said valve means having a plurality of intermediate positions for controlling flow through said outlet and said vent aperture by variably restricting said vent aperture and said outlet, spring means biasing said valve means in a vent closing direction and an outlet opening direction, first pressure responsive control means adapted for response to the pressure in said induction system downstream of said throttle and secured to said valve means for moving said valve means in a vent opening direction and an outlet closing direction



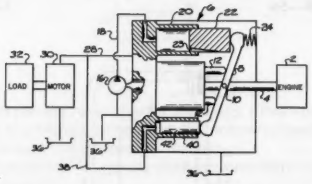
upon sudden decrease in said induction system pressure, whereby said first control means are effective for interrupting air flow to said exhaust system upon deceleration, and second pressure responsive control means adapted for resonse to said induction system pressure and adapted to engage said first control means for moving said valve means in an outlet closing direction and a vent opening direction as said pressure decreases, whereby said second control means are effetive to regulate the amount of air delivered to said exhaust system in a manner proportional to said pressure and thus in a manner proportional to the flow of exhaust gas.

3,905,194

HYDROSTATIC TRANSMISSION

Leonard H. Reimer, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Hutchinson, Kans.

Filed Sept. 4, 1973, Ser. No. 394,383
Int. Cl.² F16D *31/02*; **F04B** *1/26*
U.S. Cl. 60—449 **5 Claims**



1. A hydrostatic transmission for use between a prime mover and a load, comprising:

a. a variable displacement pump having a swash plate and a swash plate positioning cylinder connected thereto;

b. a small fixed displacement pump mechanically driven by the variable displacement pump;

c. a control piston in the positioning cylinder responsive to the output pressure of the fixed displacement pump;

d. a generally narrow tapered longitudinal groove means in the periphery of the control piston defining a bleed area and continuously venting the cylinder to reservoir, the groove means enlarging the bleed area as the swash plate tilts to increase displacement of the variable displacement pump;

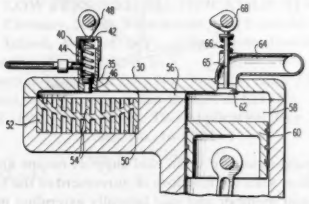
e. a biasing means urging the swash plate toward a decreased displacement position; and

f. a fluid motor driven by the output from the variable displacement pump.

3,905,195
POWER PLANT

Alvin L. Gregory, 5860 Callister Ave., Sacramento, Calif. 95819

Division of Ser. No. 186,092, Oct. 4, 1971, Pat. No. 3,787,140. This application June 5, 1972, Ser. No. 259,557
Int. Cl. F01b *29/12*
U.S. Cl. 60—512 **9 Claims**



1. A prime source of mechanical power comprising an expansion chamber having three portions situated laterally adjacent one another with the second portion having a volume less than that of the first portion and less than that of the third portion and with the second portion being situated between the first portion and the third portion so as to open into the third portion and provide an unobstructed path between the first portion and the third portion, wherein:

a. said first portion includes heat transfer fins which extend into the volume defined by said first portion, said heat transfer fins receiving the heat applied to said first portion by an external heat source;

b. said first portion has an inlet through which an expansible fluid is injected into the volume defined by said first portion and into contact with said heat transfer fins for expansion and ultimate displacement through said second portion and into said third portion; and

c. said third portion includes energy converting means which is displaced by the expanding fluid entering said third portion, and an exhaust outlet through which the fluid is exhausted after expansion has been completed.

3,905,196
GEOTHERMAL ENERGY PUMP THRUST BALANCE APPARATUS

Rangachari Govindarajan, Lakewood; James L. Lobach, Denver, and Kenneth E. Nichols, Arvada, all of Colo., assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,333
Int. Cl.[2] F03G *7/00;* **F01K** *23/00*
U.S. Cl. 60—641 **9 Claims**

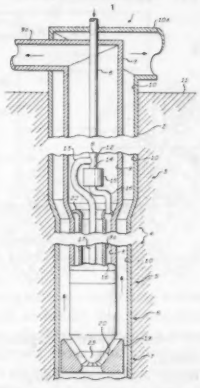
1. Geothermal deep well pump apparatus of the kind including pump means for pumping a first fluid always in liquid state for flow in cooperative energy exchanging relation with respect to a second fluid, said pump means comprising:

motor driven shaft means having a substantially vertical axis of rotation and journalled with respect to pump stator means,

plural pumping vane means affixed to said shaft means in a circular array about said axis for pumping said geothermal fluid generally upward within annular conduit means disposed about said stator means producing, when operating, a substantial downward thrust on said shaft means,

axially aligned low impedance passage way means in an end of said shaft means below said plural pumping vane means array, and

generally radial high impedance gap means between said shaft means and said stator means communicating with said low impedance passage way means,

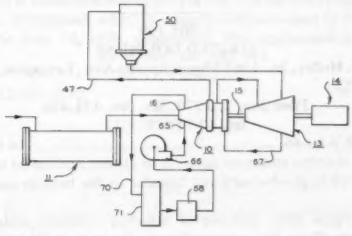


said high impedance gap means and said low impedance passage way means serving, under operating conditions, to permit predetermined flow of said geothermal fluid from the high pressure region above said plural pumping vane means array to a low pressure region below said low impedance passage way means thereby cancelling a substantial portion of said downward thrust on said shaft means.

3,905,197
POWER EXPANDER CENTRIFUGE

Arthur J. Miller, Irwin, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,016
Int. Cl. F02c *1/00;* **F01k** *25/00*
U.S. Cl. 60—646 **24 Claims**



1. Apparatus for treating relatively dirty, normally wasted, high energy gases emitted from processing equipment in order to render the gases usable as a working fluid in power recovery machinery including

centrifuge means for receiving and acting upon a dirty gas stream emitted from the processing equipment to establish a defined subflow within the main stream containing heavy dirt producing contaminants,

capture means positioned adjacent to the exit of said centrifuge means for entrapping the subflow and isolating the subflow from the main uncontaminated gas stream, and

means for delivering the uncontaminated gas stream to downstream power recovery machinery for use as a working fluid therein.

3,905,198

ROTARY THERMAL ENGINE

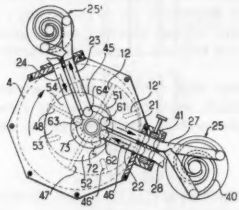
Claude Malaval, 39 rue des Coquelicots, 92160 Antony, France

Filed Oct. 17, 1973, Ser. No. 407,129

Claims priority, application France, Oct. 19, 1972, 72.37041

Int. Cl. F01k *11/00*

U.S. Cl. 60—669 **7 Claims**



1. A cylindrical rotating thermal engine comprising:

a cylindrical casing,

a quantity of liquid within said casing,

a source of heat exterior of said cylindrical casing,

a source of cold exterior of said cylindrical casing,

a plurality of wheels inside said casing mounted for rotation therein,

each of said wheels bearing radial vanes fitted with lateral rims, the axis of said wheels being parallel and eccentric in relation to the axis of the cylindrical casing,

a cylindrical ring of said liquid formed by rotation of each wheel, the lateral rims and the successive vanes of said wheels defining successive chambers having variable volume,

a propellant contained in said successive chambers, and

means for displacing said propellant in a closed circuit along a path including said chambers for successive compression, placement in contact with a source of heat, expansion to provide power, partial exhaustion from one of said chambers submitted to compression, and placement into contact with the cold source before rejection into the chamber taking up the maximum volume.

3,905,199

FOOTED DOLPHINS

Myle J. Holley, Jr., 1364 Massachusetts Ave., Lexington, Mass. 02173

Filed Jan. 7, 1974, Ser. No. 431,456

Int. Cl.[2] E02B *3/22*

U.S. Cl. 61—46 **14 Claims**

1. A dolphin structure adapted to absorb horizontal loading forces without adverse force transfer to the bottom comprising:

a vertical stem member of selected resiliency extending from above the water surface to the bottom for intercepting horizontal loading forces;

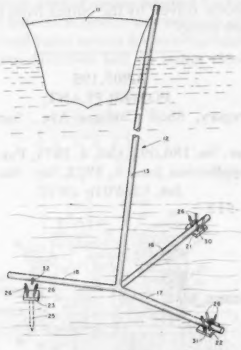
at least two laterally extending members affixed to the base of said vertical stem member to provide therewith at least three points of support for said structure and to distribute and absorb the horizontal loading forces received at the upper end of the vertical stem member by reason of their weight, length and resiliency,

said laterally extending members varied in length and angular separation in relation to the direction and magnitude of anticipated horizontal loading forces;

support means on the bottom positioned at each of the end points of support for said structure for supporting said dolphin structure above the bottom surface,

said support means disposed one adjacent the end of each of the laterally extending members and one at the base of the vertical member; and

means secured to each of said support means for maintaining said structure upon said support means and adapted to allow selected freedom of movement of the base of said vertical member and said laterally extending members in response to changes in horizontal loading applied at the water surface to said vertical member.



3,905,200

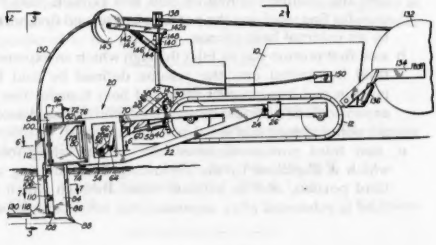
CABLE LAYING ATTACHMENT FOR VEHICLES

William A. Ylinen, 9711 SE. Butte Ave., Vancouver, Wash. 98664

Filed Mar. 18, 1974, Ser. No. 451,756

Int. Cl.[2] F16L *1/00*

U.S. Cl. 61—72.6 **7 Claims**



1. A cable-laying vehicle comprising

a. a longitudinal frame supported on movable means,

b. an elongated main frame,

c. a plow blade carrier mounted on the rear end of said main frame,

d. a plow blade supported by said carrier,

e. a cable guide shoe supported by said carrier,

f. cable feed means on said vehicle for feeding cable to said guide shoe,

g. first universal joint means arranged to connect the forward end of said main frame with a front portion of the vehicle at one side,

h. a laterally extending support arm on said vehicle,

i. said arm comprising a rigid tubular base portion telescopically receiving a rigid tubular extension in guided relation and a double acting fluid operated cylinder interconnected between said base portion and said extension

interiorly thereof and arranged to vary the length of said support arm,

j. second universal joint means at one end of said support arm connecting said end to a rearward point on said main frame,

k. and means at the other end of said support arm arranged to connect said other end to a rearward point of said vehicle,

l. said support arm in its length adjustment being capable of positioning said main frame selected distances at the rear away from said vehicle.

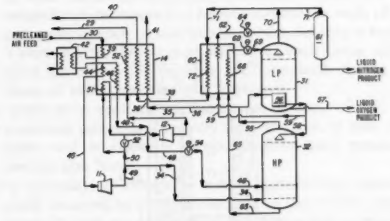
3,905,201
AIR SEPARATION WITH WORK EXPANSION TO HIGH AND LOW PRESSURE RECTIFICATION STAGES

Joseph F. Coveney, North Tonawanda, and Louis M. La Clair, Grand Island, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 849,376, Aug. 12, 1969, abandoned, and a continuation-in-part of Ser. No. 126,642, March 22, 1971, abandoned. This application July 21, 1971, Ser. No. 164,831

Int. Cl.[2] F25J *5/20*

U.S. Cl. 62—13 **10 Claims**



1. A process for the cryogenic separation of air into at least one liquid product and at least one gas product by fractional distillation at high pressure and then at low pressure wherein compressed air is cooled by heat exchange with cold streams from the process comprising the steps of: compressing said air to a head pressure of 120–700 psig, being higher than said high pressure distillation; selectively adsorbing carbon dioxide and acetylene atmospheric impurities from said compressed air prior to cryogenic cooling so as to provide precleaned air; cooling and work expanding a first minor portion comprising 1–20% of said precleaned air to a pressure below said high pressure distillation and recovering refrigeration from the resulting cold low pressure gas for the process; cooling and liquefying a second minor portion comprising 1–20% of said precleaned air to form liquid air and distilling said liquid air, with the refrigeration for said liquefying being provided by said cold streams from the process which are thereby partially warmed; partially cooling the major portion of said precleaned air by the cold streams which have been partially warmed, to temperature above the temperature of the cooled and liquefied second minor portion, and work expanding the partially cooled major portion to the pressure of said high pressure distillation such that the expanded cold fluid is substantially entirely gas, and flowing at least part of the resulting cold gas to said high pressure distillation; and withdrawing at least one liquid product and at least one gas product from the distillation and discharging such liquid and gas products from the process.

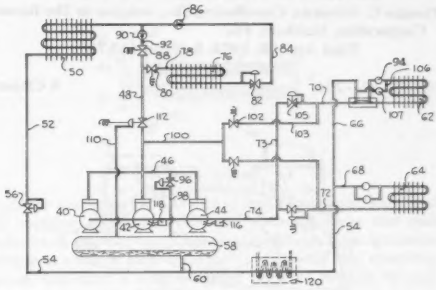
3,905,202
REFRIGERATION SYSTEM

Donald L. Taft, Glendale, Calif.; Victor W. Smith, and Neal P. Schumacher, both of Trenton, N.J., assignors to Emhart Corporation, Hartford, Conn.

Filed Jan. 8, 1974, Ser. No. 431,757

Int. Cl.[2] F25D *21/00*

U.S. Cl. 62—152 **8 Claims**



1. A refrigerating system comprising a compressor having a discharge line and an intake line, a condenser connected to the discharge line of said compressor, a receiver for receiving condensed refrigerant from said condenser, a plurality of evaporators each provided with an expansion valve, a liquid line extending from said receiver to each of said expansion valves and evaporators, a return line extending from said evaporators to the intake line of the compressor, means for selectively defrosting said evaporators by the use of hot refrigerant gas from the discharge line of the compressor, a line extending from the discharge line of the compressor to said receiver and having a pressure reducing valve therein operable to maintain the pressure in said receiver and liquid line lower than the pressure in the discharge line of the compressor, and means operable during defrost and responsive to a reduction in pressure in the receiver forincreasing the pressure in the discharge line of the compressor.

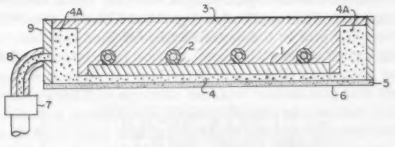
3,905,203
REFRIGERATION AND WATER CONDENSATE REMOVAL APPARATUS

Carlyle W. Jacob, 118 Presidents Ln., Quincy, Mass. 02160

Continuation-in-part of Ser. No. 370,392, June 15, 1973, which is a continuation-in-part of Ser. No. 247,449, April 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 10,824, Feb. 12, 1970, abandoned. This application June 24, 1974, Ser. No. 482,793

Int. Cl. F25d *21/00*

U.S. Cl. 62—272 **79 Claims**



1. An air cooling and water condensate removal structure of the type in which the air to be cooled contacts the structure on its exterior side but essentially does not flow into the structure so that substantially all of the air remains on the outside of the structure, said structure comprising

a cooling panel having a cold outer capillary surface for cooling the adjacent air,

means to withdraw through the capillary surface water that condenses on said capillary surface from the adjacent air being cooled,

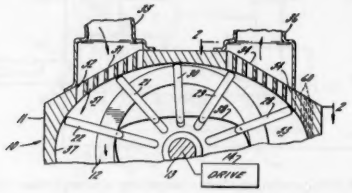
and said capillary surface having pores of a size that transmits through the surface the water that condenses on the surface but said pores blocking the transmission of most of the adjacent air beeing cooled.

3,905,204

AUXILIARY PORTING ARRANGEMENT FOR NOISE CONTROL IN COMPRESSOR-EXPANDER

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Filed Apr. 15, 1974, Ser. No. 460,755
Int. Cl.[2] F25D *19/00*
U.S. Cl. 62—296 **8 Claims**



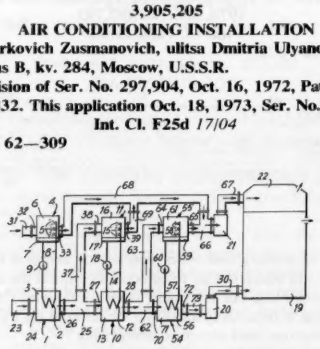
1. In a refrigeration system the combination comprising a compressor-expander including a frame defining chamber means having a compression side and an expansion side, a vane type rotor means mounted in the chamber means for positive displacement of air in the form of entering and exiting charges, the frame defining compressor side inlet and outlet ports as well as expansion side inlet and outlet ports, a heat exchanger connected between the compressor side outlet port and the expansion side inlet port so that upon driving of the rotor means air drawn into the compressor side is (1) compressed between adjacent vanes, (2) cooled in the heat exchanger to remove the heat of compression, and (3) expanded between adjacent vanes for discharge in the cold state, the chamber means having an auxiliary equalizer port spaced just slightly upstream of the expansion side outlet port and communicating with a region of ambient pressure so that, as a vane confining an exiting charge of air approaches such outlet port, air flow through the equalizer port tends to equalize the pressure of the exiting charge of air with the pressure existing at the expansion side outlet port, thereby to minimize explosive puffing of air and its attendant noise upon traverse of the vanes past the expansion side outlet port.

3,905,205

AIR CONDITIONING INSTALLATION

Lev Markovich Zusmanovich, ulitsa Dmitria Ulyanova, 4/34, korpus B, kv. 284, Moscow, U.S.S.R.

Division of Ser. No. 297,904, Oct. 16, 1972, Pat. No. 3,808,832. This application Oct. 18, 1973, Ser. No. 407,464
Int. Cl. F25d *17/04*
U.S. Cl. 62—309 **1 Claim**



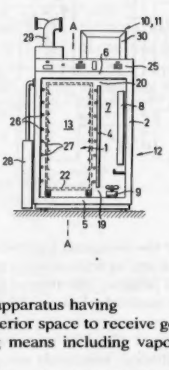
1. An installation for conditioning air in an associated space comprising: a main surface heat exchanger having an air path and an air inlet conduit through which air to be conditioned is supplied into said air path; a main mixing heat exchanger wherein air is used for cooling liquid serving as the intermediate coolant in said main surface heat exchanger; at least one auxiliary surface heat exchanger and at least one auxiliary mixing heat exchanger having the respective air paths thereof communicating through said air path of said main surface heat exchanger with said air inlet conduit of said air path of said main surface heat exchanger, whereby the air supplied into said at least one auxiliary surface heat exchanger and into said at least one auxiliary mixing heat exchanger is the air precooled within said main surface heat exchanger; the liquid coolant path of said at least one auxiliary mixing heat exchanger being connected through liquid coolant conduit means with the liquid coolant path of said at least one auxiliary surface heat exchanger, said respective air paths of said main mixing heat exchanger and of said at least one auxiliary mixing heat exchanger communicating through air conduit means, said installation comprising two said auxiliary surface heat exchangers and two said auxiliary mixing heat exchangers.

3,905,206

REFRIGERATION APPARATUS

Karl Deubel; Willi Weber, and Dieter Schuchmann, all of Mainz, Germany, assignors to Kuleg Kuhlmobelfabrik & Apparatebau GmbH, Heidesheim, Germany

Filed June 5, 1974, Ser. No. 476,541
Claims priority, application Canada, Mar. 22, 1974, 195721
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—373 **7 Claims**

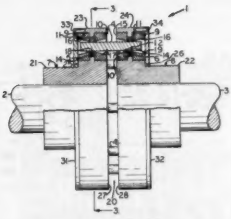


1. Refrigeration apparatus having
a. an enclosed interior space to receive goods to be cooled,
b. refrigerating means including vaporizer, compressor and condenser,
c. at least one duct opening into the interior space and being adapted for supplying within the interior space a refrigerating agent,
d. a partition in the interior space dividing the interior space into a storage space for the said goods to be cooled and a separated space, the said vaporizer being in the separated space,
e. upper and lower passageways communicating the storage space and the separated space,
f. gas circulating means arranged to cause the gas in the interior space to circulate out of the storage space into the separated space through the said lower passageway, upwardly through the separated space, and out of the separated space into the storage space through the said upper passageway, said gas circulating means including a drive motor within the interior space, and a housing for the drive motor which is generally spaced from the drive motor so as to provide an insulating gap around the drive motor, said housing at its upper side providing an opening through which a part of the drive motor is adapted to extend.

3,905,207
FLEXIBLE COUPLING

Ward S. Garrison, 1819 E. Spruce, Olathe, Kans. 66061

Filed May 13, 1974, Ser. No. 469,236
Int. Cl. F16d 3/48
U.S. Cl. 64—10 7 Claims



1. A coupling for connecting a driving shaft and a driven shaft, said coupling comprising:

a. a first hub member and a second hub member connectable to a driving shaft and a driven shaft respectively for rotation therewith, said hub members each having respective surfaces in inwardly facing relation and respective outwardly facing surfaces, said hub members each having a plurality of apertures therein, each of said apertures in one of said hub members being substantially axially aligned with a respective one of said apertures in the other of said hub members to define axially aligned pairs;

b. wear members removably mounted in said first and second hub members and having surfaces in each of said apertures in each of said hub members defining a bore of a certain size, said certain size bores each being spaced from the respective inwardly and outwardly facing surfaces of said respective hub members;

c. surfaces in each of said apertures in each of said hub members tapering outwardly from the axis of said apertures and in opposite directions from said respective certain size bores;

d. a plurality of elongated torque transmitting members each received in a respective one of the axially aligned pairs of apertures and substantially fitting said certain size bores whereby said certain size bores form fulcrums for said torque transmitting members to accommodate misalignment in all directions and transmit torque from the driving shaft to the driven shaft, said torque transmitting members being characterized by sufficient flexibility to deflect about said certain size bores when transmitting torque from the driving shaft to the driven shaft and when accommodating misalignment between the driving shaft and the driven shaft;

e. said torque transmitting members for each aligned pair of apertures being an elongate straight member and having opposite ends;

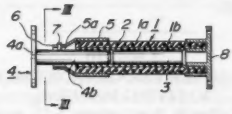
f. means connected to said first and second hub members and having portions at each of said apertures adjacent opposite ends of said torque transmitting members to retain same and permit limited endwise movement thereof in the respective aligned pairs of apertures.

3,905,208
FLEXIBLE SHAFT COUPLING

Hiroichi Oyama; Yoshinori Matsuki, and Fujio Ohkawa, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Feb. 8, 1974, Ser. No. 440,904
Claims priority, application Japan, Feb. 9, 1973, 48-16200
Int. Cl.² F16D 3/17, 3/14
U.S. Cl. 64—11 R 7 Claims

1. A flexible shaft coupling comprising: a) a cylindrical elastomeric body having an outer layer with a reinforcement embedded therein and an inner layer of softer elastomeric material than said outer layer; b) a mounting piece adapted to be fixed to a driving shaft, said mounting piece having a cylindrical shaft extending from one side and fitted within a first end of said elastomeric body; c) a cylindrical member tightly fitted about said first end of the elastomeric body so as to deform said first end radially inwardly, thereby clamping

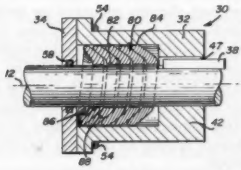


together said cylindrical shaft and said elastomeric body; and d) coupling means between said mounting piece and said cylindrical member such that only said inner layer transmits torque to a driven shaft upon initial rotation of said mounting piece, and after a predetermined angle of rotation of said mounting piece both said inner and said outer layers transmit torque to a driven shaft.

3,905,209
COMPRESSION HUB APPARATUS FOR MOUNTING A CYLINDRICAL BODY TO A ROTATABLE SHAFT

Rene A. Conrad, San Mateo, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.

Filed Mar. 14, 1974, Ser. No. 451,021
Int. Cl.² F16D 3/52
U.S. Cl. 64—15 R 3 Claims



1. In a conveyor pulley structure including a cylindrical pulley having axially apertured end walls, a round shaft extending through the pulley along its axis, and hub means for affixing each end of the pulley to the shaft, an improved hub means comprising:

an elongated cylindrical hub body having an annular flange at one end for abutting the pulley end walls, a first axial bore of a first diameter slightly larger than the diameter of the shaft and extending axially from the opposite end of said hub body toward said one end of said hub body, and a second axial bore of a second diameter larger than said first diameter and extending axially from said one end toward said opposite end and intersecting said first bore at a point along the axial length of said hub body such that when said hub body is disposed on said axle, said second bore and said axle form an annular recess of a predetermined axial length; deformable locking means disposed within said recess and including a continuous length of material having a transverse cross section generally resembling a skewed, elongated parallelogram with a pair of opposite, relatively short sides and a pair of opposite, relatively long sides, said length of material being helically wound about the shaft to form a coil wherein the coil surface corresponding to one of said short sides forms an inner periphery of the locking means for engaging the shaft, and wherein the coil surface corresponding to the

other of said short sides forms an outer periphery of said locking means for engaging the cylindrical inner surface of said second bore;

cover means for mating with said hub body and for applying an axially directed force upon said coil causing the windings of said coil to deform in such a manner that said inner periphery frictionally engages said shaft and said outer periphery frictionally engages said cylindrical inner surface thereby locking said hub body to said shaft; and means for securing said flange and said cover means to the end wall.

3,905,210

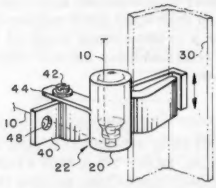
SLIDABLY MOUNTED YARN SUPPORT MEMBER FOR A KNITTING MACHINE

Robert W. McCullough, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 3, 1973, Ser. No. 403,174

Int. Cl.[2] D04B *15/48, 27/10;* **B65H** *49/02;* **F16M** *13/02*

U.S. Cl. 66—125 R **2 Claims**



1. In combination with a knitting machine and a creel supplying yarn to the knitting machine, said creel having a plurality of upright support members, the improvement comprising: yarn support members slidably mounted on each of said upright support members on said creel, said yarn support members including a body portion, a stop portion adjacent one end of said body portion, said stop portion being substantially perpendicular to said body portion, a lip portion connected to said body portion and extending toward said stop portion and an enlarged portion connected to said body portion adjacent the other end thereof having an opening therein to receive a connecting member.

3,905,211

APPARATUS FOR DETECTING DEFECTS IN NEEDLES

Jean-Pierre Raisin, Troyes, and Bernard Helffer, Saint Andre les Vergers, both of France, assignors to Centre Technique Industriel dit: Institut Textile de France, Boulogne-sur-Seine, France

Filed June 13, 1974, Ser. No. 479,119

Claims priority, application France, June 19, 1973, 73.22325

Int. Cl.[2] D04B *35/18*

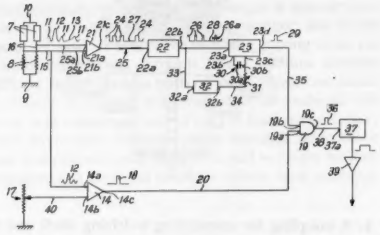
U.S. Cl. 66—157 **9 Claims**

1. An apparatus for detecting faulty needles on an operating loom, comprising:

magnetic detecting means mounted so that the needles of the loom pass successively in front of it during operation of the loom, for producing signals of a normal amplitude when non-defective needles pass in front of it, signals of greater than normal amplitude when a first class of defective needles pass in front of it and signals of smaller than normal amplitude when a second class of defective needles pass in front of it;

a first electronic circuit connected to said magnetic detecting means for identifying signals of greater than normal amplitude indicative of a defective needle, and for providing a first control signal for stopping the loom when said defective needle is detected; and

a second electronic circuit connected to said magnetic detecting means for identifying signals of smaller than normal amplitude indicative of a defective needle, and for providing a second control signal for stopping the loom when said defective needle is detected, said second electronic circuit comprising means for producing a first



output signal in response to signals which are not of smaller than normal amplitude, and for producing a second output signal in response to the absence of signals which are not of smaller than normal amplitude, during a time interval dependent on the operating speed of the loom.

3,905,212

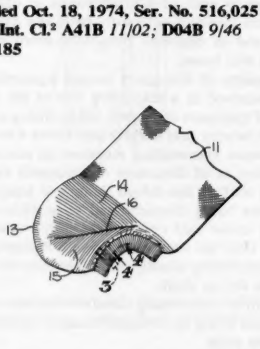
INSPECTION TOE FOR ANTI-EMBOLISM STOCKING

Daniel Barthlemy Bounous, and Earl Abee Lambert, both of Valdese, N.C., assignors to Alba-Waldensian, Incorporated, Valdese, N.C.

Filed Oct. 18, 1974, Ser. No. 516,025

Int. Cl.[2] A41B *11/02;* **D04B** *9/46*

U.S. Cl. 66—185 **7 Claims**



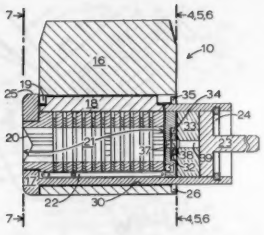
1. An anti-embolism stocking including leg and foot portions knit with stretchable yarn to provide a compressive force to the leg and foot of the wearer, said foot portion including a toe end normally covering the ends of the toes of the wearer, and a toe inspection opening normally positioned rearwardly from said toe end when said stocking is being worn, said opening being defined by a plurality of complete courses defining a single fabric thickness, said plurality of complete courses being knit of a body yarn and including spandex yarn knit in plated relationship with said body yarn in spaced apart wales of said plurality of complete courses and being floated inside of the wales between said spaced apart wales to provide a mock rib appearance and reduce the size of said opening, said plurality of complete courses providing sufficient stretch to said opening to permit said toe end to be removed from the toes of the wearer and to permit the toes to pass through said opening for inspection purposes.

3,905,213

REMOVABLE CORE DIFFERENTIAL MECHANISM

Marvin E. Roberts, Reno, Nev., assignor to Locking Systems, Inc., Reno, Nev.

Filed Apr. 5, 1974, Ser. No. 458,412
Int. Cl.² E05B 9/04
U.S. Cl. 70—368 10 Claims



1. A removable core differential mechanism for a lock cylinder, said cylinder having a body with a generally cylindrical opening therein, a retaining surface extending radially outwardly of said body opening, one or more cam surfaces extending radially inwardly of said retaining surface to a level substantially flush with said body opening, a core with a flange on one end thereof, said core being insertable into said body opening until said flange is in substantial confronting relationship with the face of said body opening, said core containing an assembly including one or more tumbler elements, means serving to releasably lock said core in relative rotation to said body, means serving to translate rotation of said core to associated latching means, a differential mechanism serving to retain said core within said body and to selectively release said core for removal from said body, closing means serving to retain said assembly substantially within said core, said differential mechanism consisting of a carrier or housing rotationally fixed in relation to said core, a plurality of links movable chordally to said carrier, portions of said links extendible outwardly of the wall of said core through slots therein, said links being yieldingly urged in an outward direction, said slots in cooperation with said carrier maintaining said links in relative rotational and axial alignment with said core, said extendible portions of said links engaging said retaining surface of said body serving to retain said core within said body, a link retracting means engaging each of said links and selectively operable, by the provision of a centrally located reaction means, to retract the remaining of said links from engagement with said retaining surface when any one of said links is urged out of engagement with said retaining surface by one of said cam surfaces.

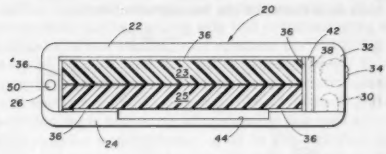
3,905,214

SKI LOCK

Sterling W. Bell, 706 Rocklyn Dr., San Antonio, Tex. 78239

Filed Jan. 25, 1974, Ser. No. 436,398
Int. Cl.² E05B 73/00
U.S. Cl. 70—58 2 Claims

1. A portable lock for snow skis comprising a pair of rigid jaws pivotally joined at a distal end and engageable in locking arrangement at a proximal end, said jaws being shaped and dimensionally adapted to snugly encompass a pair of skis when the skis are placed with the sliding surfaces juxtaposed, both skis being unidirectionally oriented, the lock further comprising securing means selectively shackling the lock to an object when the jaws are locked and simultaneously unshackling the lock from the object upon opening of the jaws, the securing means comprising a notch in at least one of the jaws the notch being opened toward the ski receiving portion of the



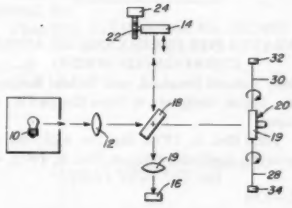
lock and adapted to receive a bracket attached to a fixed object for securing the lock to the fixed object.

3,905,215

ULTRASENSITIVE FORCE MEASURING INSTRUMENT EMPLOYING TORSION BALANCE

John R. Wright, Rt. 3, Box 931, Merritt Island, Fla. 32952

Filed June 26, 1974, Ser. No. 483,407
Int. Cl.² G01V 7/10
U.S. Cl. 73—382 10 Claims



1. A torsion balance comprising interferometer light means for measuring the formation of interference effects caused by the angular displacement of a mirror, means for pivotally mounting said mirror to produce interference effects of said light, said mounting means including a support having side members bridged by an intermediate member on which said mirror is elevated into interference with said light, a pair of torsion members laterally disposed of and attached to said side members in opposed spaced relation, support means mounted in a plane beneath said mirror having formed therein recess means, the direction of entry to which coincides substantially with the plane of the reflecting surface of said mirror, pivot means mounted in said intermediate member and in engagement with said recess means for maintaining said mirror in erect alignment, and force responsive means for pivoting said support thereby causing torsional deflection of said torsion members and a deviation in the path length of said reflected light.

3,905,216

STRIP TEMPERATURE CONTROL SYSTEM

Eric N. Hinrichsen, Schenectady, N.Y., assignor to General Electric Company, Salem, Va.

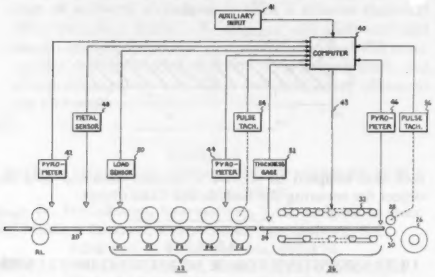
Filed Dec. 11, 1973, Ser. No. 423,756
Int. Cl.² B21B 37/10, 45/02
U.S. Cl. 72—13 22 Claims

1. For use in a rolling mill including a finishing train, a runout table with a zone of controllable cooling sprays and a coiler, the method of cooling a strip at a predetermined rate as the strip traverses the runout table comprising the steps of:

a. determining the time at which each of contiguous sections of strip is situated at predetermined locations along the runout table;

b. calculating, in accordance with prescribed formulas, for each of said contiguous sections, an individual number

and an individual, substantially uniform spacing of sprays required to cool each section from a finishing train temperature to a desired coiler temperature at a prescribed rate and as a function of the average velocity of the section as it traverses the runout table; and,



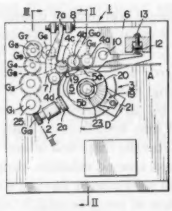
c. selectively rendering said sprays operative in accordance with the calculated number and spacing at the determined time for each of said sections as they are successively situated along the runout table.

3,905,217

APPARATUS FOR PRODUCING AN ANNULAR CORRUGATED SPRING

Hiroshi Mino; Tadashi Sasatani, and Tadaki Kobayashi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 5, 1973, Ser. No. 421,764
Claims priority, application Japan, Dec. 8, 1972, 47-123798
Int. Cl.[2] B21F *11/00*
U.S. Cl. 72—132 **9 Claims**



1. An apparatus for producing an annular corrugated spring from an elongated flat blank, said apparatus comprising forming roller means including a plurality of pairs of forming rollers for applying to an elongated band-like spring blank with flat faces a predetermined radius of curvature to provide a circular formed blank with the faces of the blank normal to the radius of curvature, means including a pair of co-operating waved rollers having complementary waved contours for applying a corrugated configuration to the circular formed blank passing through the rollers to provide a circular formed corrugated blank with the corrugations being defined inwardly and outwardly of the mean periphery of the blank, and cutting means for cutting the circular formed corrugated blank at a predetermined position to provide an annular corrugated spring.

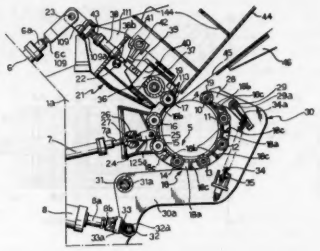
9. Method for producing an annular corrugated spring from an elongated flat blank comprising the steps of forming an elongated band-like spring blank having flat faces with a predetermined radius of curvature into a circular formed blank with the faces of the blank normal to the radius of curvature, and corrugating the circular formed blank to deform portions thereof inwardly and outwardly of the mean periphery of the blank.

3,905,218

WINDING APPARATUS FOR SHEET METAL STRIP

Cesare Galletti, Milan S. Felice, Italy, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Apr. 15, 1974, Ser. No. 461,040
Claims priority, application Italy, Apr. 17, 1973, 23095/73
Int. Cl.[2] B21C *47/00*
U.S. Cl. 72—148 **2 Claims**



1. Winding apparatus for winding sheet metal strip into coils, comprising a winding spindle, bearing structure rotatably supporting said spindle with its axis horizontal, means for conveyance of sheet-metal strip towards said spindle and means for forming the initial turns of a coil upon said spindle, wherein the improvement consists in the means for forming the initial turns of sheet-metal strip upon said spindle comprising:

i. a slide movably mounted for movement in a direction transverse to the axis of said spindle;

ii. means for moving said slide between a rest position spaced from said spindle and an operating position close to said spindle;

iii. at least one chain of freely rotatable rollers positioned at one side of said spindle, the rollers of said chain extending parallel to the axis of the spindle;

iv. at least two jaw-like arms, pivoted at one of their ends to said slide with pivot axes parallel to the axis of said spindle and supporting at the other ends respective said rollers at the ends of said chain, and

v. fluid pressure actuator means for effecting angular displacement of said arms around their respective pivot axes from a position spaced from said spindle to a position close to said spindle in which said arms partially surround the spindle;

one of said jaw-like arms which supports the roller at one end of the chain comprises a boxlike body, a horizontal pivot pin on which one side of said boxlike body is mounted, said pivot pin being supported by the slide, said body being open on the other side turned towards the spindle, a slide movable within said boxlike body in a direction perpendicular to the axis of said spindle, said slide having vertical walls supporting externally of said body the pin upon which the said roller is rotatably mounted, and fluid pressure actuator means in said boxlike body for effecting displacements of the slide relative to said body.

3,905,219

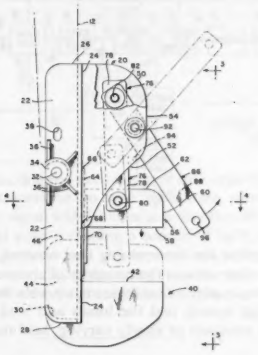
PINCER MECHANISM FOR PIPELINES

Edward Niederer, Jr., 19117-1st N.W., Seattle, Wash. 98177, and James B. Ledford, 215 N. 56th Ave., No. 10, Yakima, Wash. 98902

Filed Oct. 2, 1974, Ser. No. 511,190
Int. Cl. B21d *7/06*
U.S. Cl. 72—450 **10 Claims**

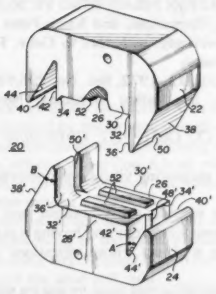
1. A pipe pincer mechanism for rapid attachment to and detachment from a back hoe boom, comprising:

a. an elongated support frame with upper and lower ends having means for detachably securing said supporting frame to said back hoe boom,
b. a pair of spaced apart mounting plates secured to said support frame,
c. an elongated upper blade arm pivotally mounted between said mounting plates outwardly of said supporting frame, said upper arm having an inner end and also an outer end for attachment to a power means for pivoting said upper arm about its mounting pivot for a predetermined distance,



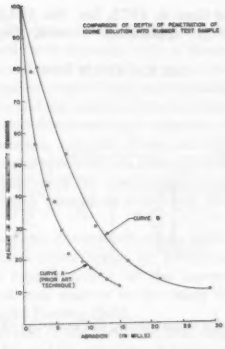
d. an elongated lower blade arm having an upper end pivotally attached to the inner end of said upper arm also having a lower end,
e. a movable blade assembly including a generally vertically disposed blade attached to the lower end of said lower arm, and
f. a generally vertically disposed fixed blade located generally at the lower end of said supporting frame and between which fixed blade and movable blade pipe may be crimped when said upper arm is pivoted upwardly to force said movable blade assembly downwardly.

3,905,220
DIE SET
Charles W. Sosinski, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Jan. 6, 1975, Ser. No. 538,807
Int. Cl.[2] B21D *37/00*
U.S. Cl. 72—475 **7 Claims**



1. An intermating die set employable with a crimping tool or the like comprising: an upper die member; and a lower die member, each of said upper and lower die members being similarly configured and including an interior crimping surface bounded by opposing first and second sides and opposing first and second ends; said first end communicating with an upstanding side wall disposed generally normal to said crimping surface and said second end communicating with a recessed portion; said upstanding side wall communicating with an inclined exterior surface; said recessed portion being defined by an interior wall disposed generally normal to said crimping surface and an inclined interior surface communicating with said interior wall at the base of said recessed portion; the included angle between said upstanding side wall and said inclined exterior surface being equal to the included angle between said recessed portion interior wall and said inclined interior surface; said upper and lower die members being proportioned so that said upstanding side wall and inclined exterior surface of one of said upper and lower die members will intermate with said recessed portion of the other of said upper and lower die members as said crimping surfaces are disposed in face to face relationship and said upper and lower die members are moved towards one another.

3,905,221
RADIOCHEMICAL METHOD FOR DETERMINING TREADWEAR
Arvind C. Patel, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.
Filed May 21, 1973, Ser. No. 362,499
Int. Cl. G01n *19/06*
U.S. Cl. 73—8 **4 Claims**



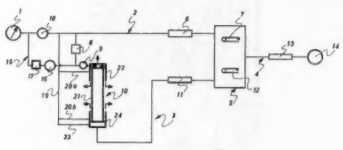
1. A method for determining the reduction in radial thickness of at least a portion of a rubber tire comprising:
a. providing at least one sample of rubber of the same composition as said rubber tire, said sample having an exposed surface of uniform flatness;
b. applying to the exposed surface of said rubber sample a section of flexible sorbent material having a minimum thickness of 25 mils and saturated with a liquid solution containing a radioactive element dispersed therein, said solution being capable of wetting and being absorbed into said rubber sample;
c. maintaining said sorbent material in intimate contact with said exposed surface for a predetermined time.
d. removing said sorbent material from contact with said tread surface;
e. measuring and recording the radioactivity of said exposed surface at the point of contact with said sorbent material;
f. in successive steps abrading the exposed surface to a uniform flatness;

g. measuring by mechanical means the thickness of rubber lost by each abrasion in (f);
h. measuring and recording the fraction of original radioactivity of said surface remaining after each successive step of abrading;
i. providing a graph of the ratio of measured radioactivity fractions of (h) versus reduction of sample thickness resulting from said successive steps of abrading of (f);
j. applying at least one section of a flexible sorbent material saturated with a solution containing a radioactive element dissolved therein, said solution being capable of wetting said tire, to and in intimate contact with the tread surface of said tire;
k. maintaining said intimate contact for a predetermined period of time;
l. removing said sorbent material from contact with said tread surface;
m. abrading said tread thickness in successive steps;
n. measuring the fraction of original radioactivity remaining at each location on said tread surface where said sorbent material of (j) has been applied; and
o. determining the remaining tread thickness at each of said measured locations by comparing the fraction of original radioactivity remaining at each location with the graph of measured radioactivity fractions versus reduction of sample thickness.

3,905,222
QUANTITATIVE GAS DETECTION APPARATUS

Pierre Boillot, Le Pecq, France, assignor to Institut de Recherches de la Siderurgie Francaise, St. Germain-en-Laye, France

Filed Sept. 6, 1973, Ser. No. 394,687
Claims priority, application France, Sept. 14, 1972, 72.32527
Int. Cl.² G01N 7/14
U.S. Cl. 73—19 **2 Claims**

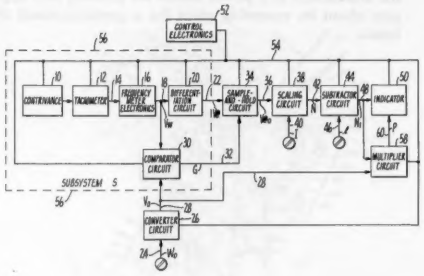


1. Apparatus for determining the quantity of gas in a sample comprising
a supply means for supplying a carrier gas under greater than atmospheric pressure,
a melting furnace comprising a tubular chamber of angular cross-section,
a vent in said chamber,
conduit means for connecting the supply means to the tubular chamber whereby said carrier gas sweeps through said chamber,
a separate sleeve surrounding each end of the chamber, each sleeve having an open end and a capped end, the capped end of each sleeve forming a seal with the respective end of the chamber, each sleeve being provided with an annular channel proximate the capped end thereof and communicating with an external wall of said chamber, the external walls of said chamber and the internal walls of said sleeves defining tubular passages open to the atmosphere and having annular cross-sections, said tubular passages communicating with said channels, and means for connecting the vent from the chamber to said annular channels whereby the gas pressure proximate each end of the chamber is increased by the carrier gas vented from the chamber thereby forming a gas seal at each end of the chamber.

3,905,223
METHOD OF MEASURING MOMENT OF INERTIA

Karl Ludloff, 159 Midvale Ave., Los Angeles, Calif. 90045

Division of Ser. No. 132,007, April 7, 1971. This application May 14, 1973, Ser. No. 359,851
Int. Cl. G01I 3/00
U.S. Cl. 73—65 **4 Claims**



1. A method for determining the moment of inertia of a rotating system without the necessity of appreciable perturbation of the operation of said system, wherein the inertial properties of said system and the losses and load acting on said system are constant or slowly varying, said method comprising;
a measurement at a particular angular velocity of angular acceleration of a rotating element of said system with a certain non-zero torque acting on said system,
using said measurement of angular acceleration to relate said moment of inertia to said torque,
changing said moment of inertia either by adding to it or by subtracting from it a known moment of inertia,
obtaining a second measure of angular acceleration of a rotating element of said system under equivalent conditions with only said moment of inertia changed by said known amount, using said second measure of angular acceleration to relate said changed moment of inertia to said torque,
establishing said moment of inertia to be determined in terms of said known change in moment of inertia and said two values of angular acceleration by taking the difference between said two relations,
averaging as many measurements as may be required to determine said moment of inertia to specified accuracy, and making said determined moment of inertia available for further use.

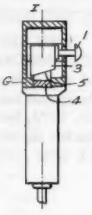
3,905,224
VIBRATION MEASURING PICKUP

Gunther Himmler, Darmstadt, and Klaus-Peter Ohms, Eberstadt, both of Germany, assignors to Gebr. Hofmann KG, Darmstadt, Germany

Filed Oct. 12, 1972, Ser. No. 296,926
Claims priority, application Germany, Nov. 26, 1971, 2158853
Int. Cl.² G01D 5/32; G01H 9/00
U.S. Cl. 73—71.3 **2 Claims**

1. A pickup for measuring vibrations comprising:
a housing
mass means for sensing the vibrations and moving as a function of those vibrations and having a portion adapted for contacting a object whose vibrations are to be detected,
spring means mounting said mass means on said housing for urging said portion against said object and permitting movement of said mass means, as a function of said vibrations in a measuring direction
a measuring member attached to said mass means for movement with said mass means in said measuring direction

and having a straight line edge extending in said measuring direction at an angle less than 45° and inclined with respect to said measuring direction to provide a mechanical reduction of the excursions of said mass means as said mass means moves as a function of said vibration and



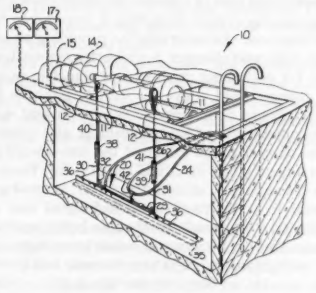
means for detecting the excursions of said edge from a path extending transverse to said measuring direction and producing a signal which varies as a function of the excursions of said edge including a source of light, means for detecting light from said source, and means for mounting said source and light detecting means with said edge extending into the path between said source and detecting means.

3,905,225

VEHICLE TESTING APPARATUS AND METHOD

Romeyn K. Moss, deceased, late of Lexington, N.C., by Rachel Tomlinson Moss, executrix, 101 Eastside Dr., Lexington, N.C. 27292

Filed Feb. 20, 1974, Ser. No. 443,956
Int. Cl.² G01L *5/13*
U.S. Cl. 73—117 **18 Claims**



11. A method of more repeatably determining the wheel horsepower delivered by the driving wheels of a vehicle under test on a chassis dynamometer comprising the steps of

supporting the driving wheels on a load roll and an idle roll while imposing on the load roll a rotational load resisting rotation of the driving wheels,

sensing the rotation of the load roll and the idle roll while indicating differences in the rates of rotation thereof and thereby indicating any slippage occurring between the driving wheels and the load roll, and

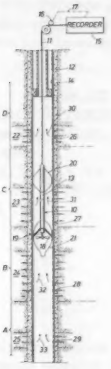
imposing on the driving wheels a controllably variable loading force acting to control slippage between the driving wheels and the load roll while varying the slip controlling force to maintain a desired relationship between the rates of rotation of the load roll and the idle roll.

3,905,226

METHODS FOR DETERMINING VELOCITIES AND FLOW RATES OF FLUIDS FLOWING IN A WELL BORE

Yves Nicolas, Versailles, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed July 1, 1974, Ser. No. 485,057
Claims priority, application France, July 27, 1973, 73.27665
Int. Cl.² E21B *47/10*
U.S. Cl. 73—155 **21 Claims**



1. A method for determining the actual velocity of a fluid flowing in a well bore interval with a flowmeter having a rotatable spinner adapted to turn in a rotational direction and at a rotational speed respectively representative of both the relative direction and the relative velocity of said flowing fluid with respect to said flowmeter and comprising the steps of:

passing said flowmeter upwardly along said well bore interval at a selected travel speed for obtaining at least one measurement representative of the corresponding rotational speed of said spinner in one of its rotational directions in said flowing fluid;

passing said flowmeter downwardly along said well bore interval at a selected travel speed for obtaining at least one measurement representative of the corresponding rotational speed of said spinner in the other of its rotational directions in said flowing fluid;

repeating at least one of the aforespecified steps at a different selected travel speed for obtaining at least another measurement representative of the corresponding rotational speed of said spinner in said flowing fluid;

correlating said measurements for determining the upper and lower limits of the range of relative fluid velocities which are respectively ineffective for inducing rotation of said spinner in either of its said rotational directions; and, thereafter,

averaging said upper and lower velocity limits for determining the actual velocity of said flowing fluid in said well bore interval.

3,905,227

WIRELINE OPERATED TUBING DETECTOR

Myron M. Kinley, 103 Maple Ln., Chickasha, Okla. 73018

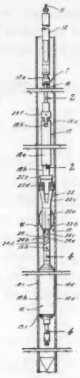
Filed Feb. 1, 1974, Ser. No. 438,739
Int. Cl.² E21B *49/00*
U.S. Cl. 73—151 **16 Claims**

1. A wireline operated tool for obtaining the impression of the inside wall of well tubing, comprising:

A tubular support housing adapted for positioning within a well tubing on a wireline;

yieldable memory means mounted with said tubular support housing, said yieldable memory means being inflatable into engagement with the inside wall of said well tubing for making impressions of any damaged areas or defects in said inside wall caused by corrosion or other means;

wireline actuated means for expanding said yieldable memory means into engagement with said inside wall for obtaining such impressions and for thereafter deflating said



memory means for removal of said tool from said well tubing, said wireline actuated means including:

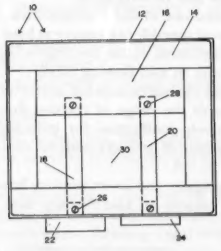
double piston means mounted for movement longitudinally within said tubular support housing for pressurizing said yieldable memory means to a first pressure and then to a second pressure higher than said first pressure to cause said yieldable memory means to effectively enter defects or damaged areas in said inside wall to obtain impressions thereof.

3,905,228

MECHANICAL HEAT FLUX RECORDER

Warren K. Smith, Poway, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,088
Int. Cl.[2] G01K *17/00*
U.S. Cl. 73—190 H **7 Claims**



1. A pyrometric device comprising:

a heat sink in the form of a solid metal block;

at least two heat receiver means each in the form of a flat disc;

said heat receiver means each being connected to said heat sink by a strip of material which may be deformed from an original shape to a deformed shape and retained at said deformed shape at ordinary temperatures but which will return to the original shape when subjected to a predetermined transformation temperature; and

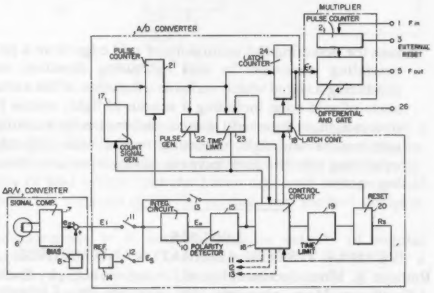
a container of insulative material covering all of the components except for faces of said heat receiver means remote from said heat sink so that said strips are progressively heated from said heat receiving means toward said heat sink and are thus induced to return toward said original shape in proportion to the heat encountered by said receiver means.

3,905,229

TEMPERATURE COMPENSATING SYSTEM

Masaaki Togo, Kawasaki, and Nobuo Takeuchi, Inagi, both of Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 26, 1973, Ser. No. 401,066
Claims priority, application Japan, Oct. 9, 1972, 47-100633
Int. Cl. G01f *1/00, 15/02*
U.S. Cl. 73—194 E **7 Claims**



1. In a system for measuring a quantity in terms of a pulse signal corresponding to the measurement, which measurement is subject to error due to environmental changes to which said quantity is exposed, a compensating system to produce a conversion coefficient for referring said measurement to a reference base or standard environmental condition, said compensating system including a transducer having a non-linear response characteristic for providing an output in accordance with said changes, a converter responsive to said transducer for producing an electrical signal in accordance with said changes, said converter including means having a non-linear response characteristic similar to said non-linear response characteristic of said transducer and connected to oppose and neutralize the effect of the non-linearity of said transducer whereby said electrical signal is free from the said non-linear characteristic of said transducer, an analog-to-digital converter to convert said electrical signal into a corresponding digital value, said digital value being representative of said conversion coefficient and means to multiply said pulse signal by said digital value to compensate said pulse signal thereby to provide an output pulse signal that is referred to said base or standard environmental condition, said transducer being a temperature-sensitive resistance, said first-mentioned converter including a bridge circuit having said temperature-sensitive resistance connected in one arm thereof, means including a series resistor for connecting a source of voltage across the energizing terminals of said bridge, an operational amplifier having an inverting input and a non-inverting input and an output, means connecting said inverting input of said operational amplifier to an output junction of said bridge which is directly connected to said temperature-sensitive resistance, means connecting an opposing output junction of said bridge to said non-inverting input of said operational amplifier, and an output circuit connected to the output of said operational amplifier to produce a voltage representative of the output from said operational amplifier, said output circuit being connected to said voltage source through said series resistor.

3,905,230

DEVICE FOR MEASUREMENT BY ACTIVE SENSOR

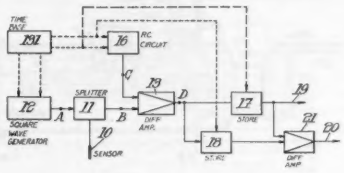
Pierre Calvet, and Francois Liousse, both of Toulouse, France, assignors to Office National d'Etudes et de Recherches Aerospattiales (O.N.E.R.A.), France

Filed July 5, 1973, Ser. No. 376,416

Claims priority, application France, July 21, 1972, 72.26310

Int. Cl.[2] G01F *1/68;* G01P *5/12*

U.S. Cl. 73—204 14 Claims



1. A device for measuring the thermal dissipation coefficient of a thermoresistant measuring sensor immersed in a fluid medium for determining a parameter characterizing said medium, said device comprising:

a pulse generator for delivering in succession to said measuring sensor a first and a second electric pulse having predetermined levels and durations sufficiently short there to be no appreciable heat transfer to the fluid medium during their duration and separated by a predetermined time interval sufficiently short for the sensor not to return to thermal equilibrium with the medium between said pulses;

a simulating circuit simulating a sensor in a reference medium and providing outputs representative of the electric resistance characteristics of said simulated sensor,

means connected to said measuring sensor and said simulating circuit providing first signals representative of electric resistance characteristics of said measuring sensor and said simulated sensor during said first pulse, and second signals representative of electric resistance characteristics of said measuring sensor and said simulated sensor during said second pulse;

and means for deriving from said first signals and said second signals a third signal characterizing the thermal dissipation coefficient value of said measuring sensor in said fluid medium relative to said reference medium during the time interval separating the first and second pulses.

3,905,231

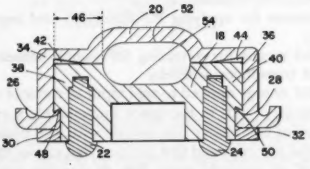
GAS METER PART

Earle E. Campbell, and James E. Fosnaugh, both of Lancaster, Ohio, assignors to National Meter Parts, Lancaster, Ohio

Filed Dec. 27, 1973, Ser. No. 428,818

Int. Cl.[2] G01F *3/22, 15/16*

U.S. Cl. 73—267 4 Claims



1. In a gas meter of the type comprising a diaphragm driven center pan assembly and a flag rod secured to said center pan operative in an orbital movement to move said diaphragm in a reciprocating movement, means for securing said rod comprising:

a bracket including an upper portion and a base fixedly secured to said center pan;

said upper portion having folding sides of a complimentary dimension to grip the outside walls of said base and the lower ends on said outside walls extending inwardly and upwardly to lock complimentary ends of said folding sides onto said base;

said base having formed therein a one half oval depression; said upper part also having formed therein a one half oval portion, said oval slots having its greater dimension in the horizontal, and wherein when said upper portion is fixed in said base portion an oval slotted area is formed in said bracket to receive and movably return said flag rod.

3,905,232

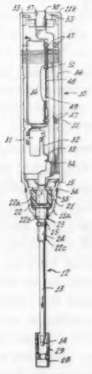
ELECTRONIC THERMOMETER

Wallace L. Knute, San Diego, Calif., assignor to IVAC Corporation, La Jolla, Calif.

Filed Oct. 5, 1973, Ser. No. 403,898

Int. Cl.[2] G01K *1/08, 7/16*

U.S. Cl. 73—362 AR 12 Claims



1. For use with an electronic thermometer employing a temperature sensing probe and removable probe cover, automatic actuation and deactuation means, comprising in combination:

a switch for switching the thermometer on and off; and

means responsive to installation of a probe cover on the temperature sensing probe, for placing said switch in an "on" condition, said means also being responsive to ejection of the probe cover for returning said switch to an off" condition.

3,905,233

PACKAGE PENETRATION INDICATING APPARATUS

Lawrence W. Smith, Jr., Natick, and Norman D. Roberts, Framingham, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

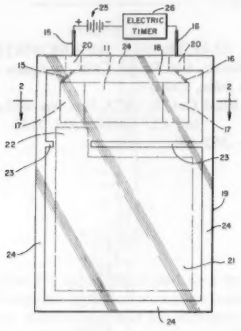
Filed Mar. 26, 1974, Ser. No. 454,898

Int. Cl.[2] G01M *3/34;* H01H *35/24*

U.S. Cl. 73—432 R 10 Claims

1. Apparatus for use in determining the resistance of a flexible packaging material to penetration, which comprises in combination:

a. a gas-tight, evacuated and hermetically sealed flexible package,
b. switch means located within said package which responds to the evacuation of said package by closing, is maintained in a closed position within said package as long as said package remains evacuated, and responds to a loss of vacuum within said package by converting to an open position,
c. electrically energized circuit means in electrical communication with said switch means and extending to the exterior of said package, and
d. signal means in electrical communication with said circuit means for detecting any interruption in the electrical circuit, whereby a loss of vacuum in said package causes



said switch to open breaking said electrical circuit which event is detected by the signal means.

8. Method of determining the resistance of a flexible packaging material to penetration comprising the steps of:
a. exposing an evacuated and hermetically sealed flexible package comprised of said flexible packaging material to a penetration producing means,
b. detecting a loss of vacuum in said package by the action of a mechanical means for indicating a loss of vacuum inclosed within said package, and
c. determining the period of time between the exposure of said package to said penetration producing means and the loss of vacuum within said package, the resistance of said flexible packaging material to penetration being proportional to said time period.

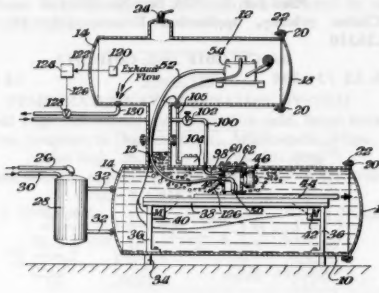
3,905,234

UNDERWATER WELDING TEST CHAMBER

Ernest H. Berghof, Orlando, Fla., assignor to Anna Welding Corporation, Orlando, Fla.

Filed Aug. 9, 1974, Ser. No. 496,201
Int. Cl.² G01M *19/00*
U.S. Cl. 73—432 SD **16 Claims**

1. Apparatus for testing an underwater welding device, said device having a hand portable housing incorporating a welding aperture, a viewing window opposite said aperture, gas means for purging said housing of water with a shielding gas, and means for introducing a welding gun into said housing for effecting welding of a workpiece through said welding aperture, said apparatus comprising, in combination:
means defining upper and lower interconnected regions for containing respective gas and water volumes,
means for supplying water to said lower region,
adjustable support means disposed in said lower region for supporting said workpiece;
means defining a viewing plate in the wall of said lower region,
mounting means for mounting said housing within said lower region between said viewing plate and said workpiece with the viewing window contiguous said viewing plate and the welding aperture contiguous said workpiece, and



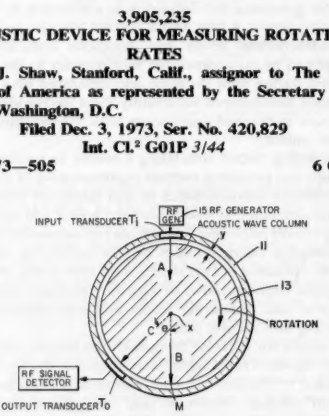
control means for varying the exhaust of shielding gas from said upper region, thereby to simulate the water pressure at various depths in said lower region.

3,905,235

ACOUSTIC DEVICE FOR MEASURING ROTATION RATES

Herbert J. Shaw, Stanford, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 420,829
Int. Cl.² G01P *3/44*
U.S. Cl. 73—505 **6 Claims**



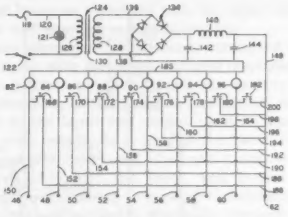
1. An acoustic sensing device for measuring the angular velocity of a rotating spherical body comprising:
a. at least one input transducer;
b. at least one output transducer;
c. a housing radially encompassing and spaced from the periphery of said spherical body;
d. said input transducer and said output transducer located in said housing respectively at first and second positions;
e. the outer surface of said spherical body comprising piezoelectric material;
f. first means for applying RF energy to said input transducer;
g. second means for detecting RF signals sensed by said output transducer; whereby
h. said RF energy applied to said input transducer results in RF electric fields in the space immediately surrounding said input transducer that couple with said piezoelectric material adjacent said first position that causes the formation of an acoustic wave that propagates towards the interior of said spherical body and impinges upon said piezoelectric material of said spherical body adjacent said second position that is sensed by said output transducer thereby denoting the angular velocity of said spherical body.

3,905,236

APPARATUS AND PROCESS FOR CONTINUOUSLY MONITORING THE DEPTH AND LOCATION OF STANDING WATER ON AIRCRAFT RUNWAYS AND THE LIKE

Richard Dale Henry, Hookstown Grade Rd, R.D. No. 1, Clinton, Pa. 15026

Filed May 7, 1973, Ser. No. 358,150
Int. Cl.² G01F *23/00, 23/20*
U.S. Cl. 73—304 R 2 Claims



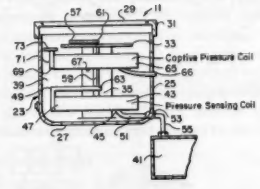
1. In a process for continuously monitoring the depth and location of standing water on aircraft runways and the like, the improvement comprising the steps of sensing the depth of water through a series of probes each having at least one exposed conductor portion at spaced increments from the surface of the runway and each independently and electrically operatively connected to a remotely disposed readout device having a series of indicator means, supplying a rectified direct current energy source to each of said read out devices which are connected in parallel, connecting each of said readout devices to said rectified direct current supply voltage through separate and independently operatable switching means to determine the workability of each such indicator means and separately and independently communicating an alternating current source through a transformer means and diode bridge to provide a DC voltage communicable to each such indicator means through said respective exposed conductor portions which act as sensing switches and wherein each indicator means includes a resistance to protect each such indicator means.

3,905,237

TEMPERATURE COMPENSATED PRESSURE GAUGE

Anthony A. Smalarz, Agoura, and Roger T. Yule, Canoga Park, both of Calif., assignors to Kratos, Pasadena, Calif.

Filed Sept. 23, 1974, Ser. No. 508,289
Int. Cl.² G01L *19/04*
U.S. Cl. 73—393 10 Claims



1. A temperature compensated pressure gauge for indicating the gas pressure being monitored relative to an acceptable operating zone defined by minimum and maximum allowable pressure limits over a predetermined temperature range, the gauge comprising:

a pressure gauge housing including a visible dial face with a fixed marking indicating said minimum allowable pressure limit;

a gas medium sealed in said housing, said gas medium having essentially the same pressure-to-temperature characteristic as that of a gas medium being monitored, said gas medium sealed in said housing being at said minimum allowable pressure, said housing being located in the same temperature environment as that of the gas medium being monitored and the contents of said housing being subject to essentially the same temperature;

pressure sensing means including a first Bourdon coil mounted in said housing and disposed in said gas medium sealed therein, the interior of which coil being coupled to a port in said housing for communicating only with the gas medium being monitored, said first coil including a movable end portion operatively coupled to a first dial indicator member, a non-temperature related changing pressure differential of a gas medium in said first coil as compared to that of said gas medium sealed in said housing causing rotational movement of said movable end portion and of said first dial indicator member relative to said fixed marking on said dial face; and

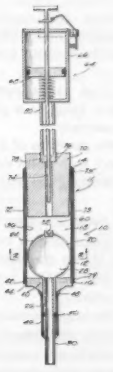
reference means including a second Bourdon coil mounted in said housing and disposed in said gas medium sealed therein, said second Bourdon coil having a gas medium with essentially the same pressure-to-temperature characteristic as that being monitored sealed therein and also having a movable end portion operatively coupled to a second dial indicator member, said second Bourdon coil having essentially the same pressure differetial-caused movement characteristic as that of said first Bourdon coil, the spatial relationship between said fixed marking on said dial face and said second dial indicator member for continuously defining said acceptable operating zone over said predetermined temperature range, said first dial indicator member indicating the pressure of a gas being monitored relative to said acceptable operating zone.

3,905,238

PNEUMATIC METAL SAMPLER

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53203

Filed June 7, 1973, Ser. No. 367,919
Int. Cl. G01n *1/12*
U.S. Cl. 73—425.6 5 Claims



1. A molten metal sampler comprising wall means defining a sample mold having a mold cavity and an air vent, wall means defining a housing, said sample mold including a fill tube, securing means for securing said sample mold in the interior of said housing in a fixed position with said fill tube projecting from said housing during use and permitting ready separation of said mold from said housing to retrieve said

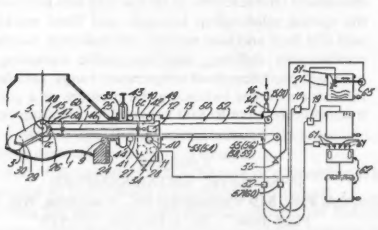
sample, said securing means further providing an air seal between said housing and said mold cavity forwardly of the mold cavity, pressure reducing means for reducing the pressure in said sample mold, and coupling means for detachably coupling said pressure reducing means to said housing to provide for rapid assembly and disassembly of said housing from said pressure reducing means and further provide an air seal between said pressure reducing means and said housing to afford evacuation of said housing and said sample mold by activation of said pressure reducing means, and including a length of deoxidant fixed to said wall means defining a sample cavity, said deoxidant extending through said sample cavity and said fill tube.

3,905,239

TRAILING GAUGE

Edouard Legille, Grand Duchy of Luxembourg, Luxemburg, assignor to S.A. des Anciens Etablissements Paul Wurth, Grand Duchy of Luxembourg, Luxemburg

Division of Ser. No. 308,800, Nov. 22, 1972, Pat. No. 3,816,932. This application Dec. 5, 1973, Ser. No. 421,753
Int. Cl.² G01N *1/22*
U.S. Cl. 73—432 R **19 Claims**



1. Apparatus for taking measurements at an inaccessible surface having a variable contour comprising:

gauge arm means:

means supporting said gauge arm means for movement axially along a line lying in a plane disposed above the surface to be measured;

means for sensing the position of a point on said gauge arm means with respect to a point on the surface to be measured and for generating a signal commensurate with said sensed position;

swing arm means pivotally attached to said gauge arm means, said swing arm means being rotatable relative to a plane disposed above the said surface and containing said line, a first end of said arm means contacting the surface to be measured;

means for sensing the angle between said swing arm means and said plane during movement of said gauge arm means and for generating a signal commensurate with said angle whereby the contour of the surface may be determined by combining information commensurate with the position of said swing arm means first end provided by said signals generated by said position and angle sensing means;

means on said swing arm means for sensing a dynamic condition at the surface being measured; and

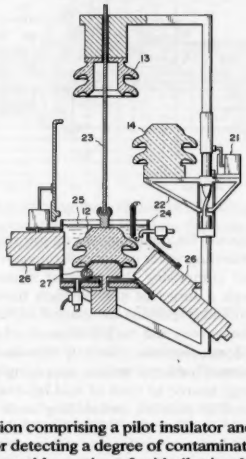
means transmitting information commensurate with said sensed dynamic condition to a remote location whereby the profile of said surface and a dynamic condition at said surface may be simultaneously meansured.

3,905,240

PILOT INSULATOR FOR DETECTING DEGREE OF CONTAMINATION THEREOF

Hiroshi Igarashi, Nagoya; Toshiyuki Kawaguchi, Inuyama, and Kenji Sakanishi, Inazawa, all of Japan, assignors to NGK Insulators Ltd., Nagoya, Japan

Filed May 24, 1973, Ser. No. 363,617
Claims priority, application Japan, June 7, 1972, 47-55960
Int. Cl.² G01N *33/00*
U.S. Cl. 73—432 SD **10 Claims**



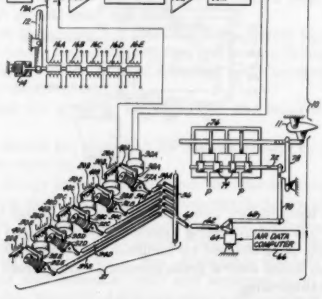
1. A combination comprising a pilot insulator and insulator-shaped bodies for detecting a degree of contamination thereof comprising a removable portion of said pilot insulator having a known exposed surface area said portion in combination with an upper and lower support forming an assembled pilot insulator whose configuration is substantially the same as that of insulators used in practice.

3,905,241

ELECTRICAL PRIMARY FLIGHT CONTROL SYSTEM

James W. Downing, Buena Park; Carlos P. Fernandez, Westminster, and Vernon C. Sethre, Santa Ana, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Oct. 29, 1973, Ser. No. 410,535
Int. Cl.² B64C *13/40*; G05G *1/00*
U.S. Cl. 74—470 **2 Claims**



1. A control system for transmitting position information including:

means for producing at least three mechanical outputs representative of the position information;

discriminator elements connected to receive said mechanical outputs and to produce outputs therefrom, said elements each including an input member, an output member, a link pivotally connecting said input and output members, and means for applying force between said input and output members across said connecting link, said last named means including a spring, a cage for said spring having first and second ends, and a rod connecting said first cage end to one of said members, said second cage end being in abutment with the other member to maintain said spring in compression; and

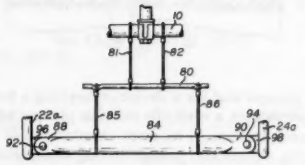
discriminator elements output means connected mechanically to move with the outputs of said discriminator elements to produce a system output representing the position information, said discriminator elements being constructed so the input and output position thereof is in general correspondence as long as the force thereacross is in a predetermined band, when said force exceeds said predetermined band, the input and output position thereof no longer being in general correspondence and the force thereacross being nominally constant.

3,905,242

AUXILIARY BICYCLE BRAKE ARRANGEMENT

William B. Hoffman, 67 Ships Point Ln., Oyster Bay, N.Y. 11771

Filed Jan. 15, 1974, Ser. No. 433,548
Int. Cl.[2] B62K 23/06; B62L 3/02; G05G 9/00
U.S. Cl. 74—480 R 2 Claims



1. A braking device for use on a racing bicycle handle of the type having a crossbar and handle portions at the ends of the crossbar extending generally transversely of the crossbar and on which pivotal brake handle levers are mounted, comprising an auxiliary brake handle means extending parallel to said crossbar, said auxiliary brake means including at least one rigid element in the form of a cross member, means providing for a relatively movable connection between said cross member and said pivotal brake handle levers, said means including lateral flange elements on said pivotal brake handle levers and pivot pins pivotally connecting said cross member to said lateral flange elements, whereby the auxiliary brake handle means may be grasped by a rider to apply the brakes while the rider has his hands on the crossbar or other locations of the bicycle handle and the movable mounting means of said rigid element on the brake handle levers insures application of equalized pressure on both of said pivotal brake handle levers.

3,905,243

LIQUID-LEVEL SENSING DEVICE

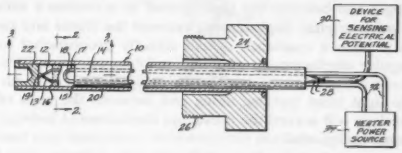
George T. Goldfuss, Joliet, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 11, 1973, Ser. No. 396,339
Int. Cl.[2] G01F 23/22; H01L 35/00
U.S. Cl. 73—295 1 Claim

1. A device for sensing the level of a liquid, comprising:

two dissimilar metal wires enclosed within and protruding from one end of an electrical insulating material, the protruding ends of said wires being joined together to form a thermocouple junction;

a heating wire for maintaining said liquid-level sensing device at a temperature above that of the environment above the liquid, said heating wire being disposed with said electrical insulating material and electrically insulated from said dissimilar metal wires, said insulating material being in the form of a solid ceramic cylinder having a land surface and a recessed surface at one end thereof, there being two tubular ducts passing longitudinally through said cylinder to form apertures in said land surface and two tubular ducts passing longitudinally through said cylinder to form apertures in said recessed surface, the ducts forming apertures in said recessed surface being shorter than the ducts forming apertures in said land surface, said heating wire being disposed within



the two shorter ducts and forming a U-shaped loop exterior to and between the apertures in said recessed surface, each of said dissimilar metal wires being disposed within one of the two longer ducts;

a tubular metal sheath having an inside diameter larger than the outside diameter of said cylindrical insulating material thereby allowing said cylindrical insulating material to be slip fitted into said tubular sheath;

a solid metal plug securely sealing one end of said tubular metal sheath and in contact with said thermocouple junction;

electrical connections between said heating wire and a power source for activating said heating wire; and

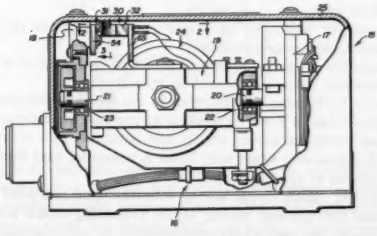
electrical connections between said dissimilar metal wires and a device for sensing the electrical potential across said thermocouple junction.

3,905,244

PHOTO-OPTICAL PICKOFF FOR GYRO

David I. Gleason, and Ehnerd H. Anderson, both of Grand Rapids, Mich., assignors to R. C. Allen, Inc., Grand Rapids, Mich.

Filed Apr. 17, 1973, Ser. No. 352,046
Int. Cl. G01c 19/28
U.S. Cl. 74—5.6 A 17 Claims



1. A gyroscopic instrument for a vehicle comprising, a frame adapted to be mounted on the vehicle for movement therewith, a gimbal mounted on said frame for pivotal movement about an axis, a rotor rotatably mounted on said gimbal about an axis normal to the pivot axis of said gimbal, and a photo-optical pickoff for measuring relative angular displacement between the frame and the gimbal, said pickoff compris-

ing a first element mounted on the frame for movement therewith and a second element coacting with the first element and mounted on the gimbal for movement therewith, one of said elements being a variable resistance light responsive device having infinite and proportional resolution between the ends thereof and being insensitive to variation in light intensity, said light responsive device including a bar-shaped substrate, an elongated film resistor portion on one face of the substrate, a photosensitive portion adjacent the film resistor portion on said one face and of the same length thereof, an electrode portion on said one face adjacent the photosensitive portion insulated from the film resistor portion and of the same length thereof, and means for driving and loading said device, and the other of said elements being means defining a light band of narrow width coacting with the light responsive device for projecting onto and across the resistor, photosensitive and electrode portions of the light responsive device along the length and between the ends thereof in accordance with the relative angular displacement between the frame and gimbal to provide a resistance output directly proportional to the angular displacement, and said resistor, photosensitive and electrode portions of said device being of such a length that the light band traverse along and between the ends of the portions will accord the maximum displacement between the frame and gimbal.

3,905,245

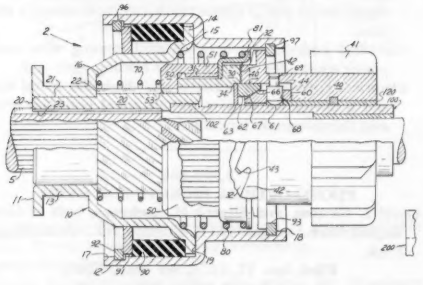
ENGINE STARTER GEARING

Harold R. Mortensen, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 10, 1973, Ser. No. 423,635

Int. Cl. F02n *17/00*

U.S. Cl. 74—7 C **13 Claims**



1. Starter gearing comprising:

a shaft;

a intermediate member having a forward end and a rearward end;

means for mounting said intermediate member on said shaft, said means including:

means for providing axial and rotational movement of said member mounted on said shaft; and

means for biasing said member in the forward direction so that when a force is applied in the rearward direction, said member moves axially and rotatably in a rearward direction and when said force is removed, said member returns to its original position;

a driving clutch sleeve having a forward and rearward end, said forward end having axially extending clutch teeth;

means for mounting said driving sleeve on said intermediate member, said means including:

means for providing axial movement of said driving sleeve with respect to said intermediate member; and

means for biasing said driving sleeve in the forward direction so that when a force is applied in the rearward direction, said driving sleeve moves axially in a rearward direction and when said force is removed, said driving sleeve returns to its original position;

a driven clutch sleeve having radially extending gear teeth on one end portion and axially extending clutch teeth on the opposite end; and

means for mounting said driven sleeve on said shaft for rotational and axial movement with respect to said shaft, said driven sleeve disposed so that the clutch teeth of said driven sleeve engage said driving sleeve clutch teeth for transmitting torque between said driving sleeve and said driven sleeve to rotate said driven sleeve;

whereby when a rearward force is applied to said driven sleeve, said driven sleeve and said driving sleeve move axially rearward with respect to said intermediate member and said intermediate member moves rotatably and axially rearward with respect to said shaft, so that when said rearward force is removed said driving clutch sleeve moves in a direction of said driven clutch sleeve while said mutually engageable clutch teeth are maintained in full engagement.

3,905,246

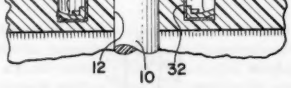
CONSTRUCTION AND METHOD FOR FORMING A PLUNGER SEAL

Alvin Herman Breckenfelder, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 5, 1974, Ser. No. 476,487

Int. Cl.² F16D *3/84*; **F16J** *15/56*

U.S. Cl. 74—18.2 **2 Claims**



1. In a plunger seal for a device comprising a housing with an aperture therein, a vertically movable plunger which passes through said aperture, a recessed circular groove formed in said housing around said plunger having substantially vertical inner and outer walls and a substantially horizontal base and a thin flexible circular membrane having a central aperture which forms a compression seal with said plunger and an outer periphery which extends into said groove so that said thin flexible membrane engages said inner wall and at least a portion of said base, the improvement comprising a securing member having a plurality of external teeth and a vertically, circular extending rim wherein said teeth of said securing member are wedged into said outer wall of said groove so as to compress said membrane between said teeth and said base and between said rim and said inner wall of said groove.

3,905,247

CLUTCHES

John Hayward Cook, Sawbridgeworth, England, assignor to Xerox Corporation, Stamford, Conn.

Filed June 11, 1974, Ser. No. 478,210

Claims priority, application United Kingdom, Dec. 21, 1973, 59532/73

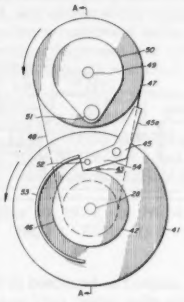
Int. Cl. F16d *43/26*, *11/02*

U.S. Cl. 74—82 **5 Claims**

1. A reproduction machine having a document scanning system, and an improved means for operating the latter, said means comprising:

a recycling clutch comprising rotatable input and output elements, cooperating drive engagement means on said elements respectively, one of which is pivotally mounted on its associated element and biased for engagement with the engagement means on the other element, a rotatable timing element adapted to be driven by said input element and arranged to come into engagement with said

pivotally mounted engagement means to effect release of the clutch at intervals greater than a revolution of said input element, and means for maintaining said engagement means disengaged for a sufficient length of time to permit rotation of the output element in reverse direction under the influence of a biasing means through greater than one revolution.



3,905,248

FRONT CHAIN-WHEEL ARRANGEMENT FOR BICYCLES

Marcel Peyrard, 6 Avenue Jules Ferry, Saint-Chamond (Loire), France

Filed Feb. 22, 1974, Ser. No. 444,995

Claims priority, application France, Feb. 23, 1973, 73.07417

Int. Cl.² F16H *7/18, 55/30*

U.S. Cl. 74—243 R **8 Claims**

1. A multi-step toothed wheel for driving a chain, including at least one great toothed ring and one small toothed ring which are mounted side by side to rotate about the same axis, characterized in that a frusto-conical surface is provided between the two rings, the smaller base of said surface being close to the small ring and having a diameter lower than that of the circumference defined by the tips of the teeth of said small ring, while the greater base of said frusto-conical surface lies against the great ring and has a diameter higher than that of the above-mentioned circumference which ideally interconnects the peripheral tips of the teeth of the small ring, so that said frusto-conical surface acts as a guide for the chain when the latter jumps from one ring to the other, said frusto-conical surface is of integral one-piece construction with the great ring to provide a transition between a central hub of the great ring and the peripheral teeth thereof.

3,905,249

CRANK HANDLES FOR FISHING REELS

Ake Eugen Murvall, Svangsta, Sweden, assignor to Abu Aktiebolag, Svangsta, Sweden

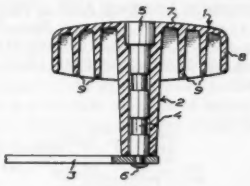
Filed May 6, 1974, Ser. No. 467,587

Claims priority, application Sweden, May 11, 1973, 7306662

Int. Cl.² G05G *1/10, 1/12*

U.S. Cl. 74—543 **4 Claims**

1. A crank handle for a fishing reel and means for attaching the handle to a fishing reel crank, said attaching means comprising an axle, said crank handle comprising a hand grip member having an outer side and an inner side, and a tubular shank portion integral with said hand grip member for receiving said axle, said hand grip member comprising a wall member having an outer side which forms said outer side of the hand grip member and also having an inner side, said tubular shank portion being integral with said wall member and extending inwardly from the inner side thereof, a continuous flange integral with and extending inwardly from the periphery of said wall member to said inner side of said hand grip member substantially in parallel relation with said shank portion, said flange forming opposite side and end walls of said hand grip member, and, on either side of said shank portion,



at least one transverse reinforcement partition integral with said wall member and said flange extending between said opposite side walls in spaced relation to said opposite end walls and to said shank portion from said inner side of said wall member to said inner side of said hand grip member, said flange and said at least one partition having free edges disposed at said inner side of said hand grip member forming finger supports for a hand grasping said crank handle for operating the fishing reel, and said wall member, said flange and said at least one partition defining a plurality of open cavities at said inner side of said hand grip member.

3,905,250

GEAR ASSEMBLIES

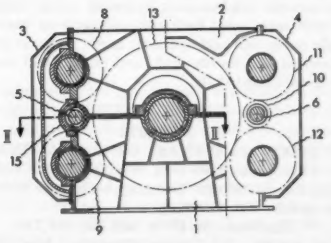
Hans Sigg, Mutschellen, Switzerland, assignor to Maag Gear-Wheel & Machine Co., Ltd., Zurich, Switzerland

Filed Aug. 2, 1974, Ser. No. 494,280

Claims priority, application Switzerland, Dec. 19, 1973, 17837/73; Netherlands, Mar. 3, 1974, 7403709; Sweden, Feb. 22, 1974, 74024100; France, Feb. 1, 1974, 74.03502; Italy, July 2, 1974, 24693/74; Japan, Mar. 25, 1974, 49-32706

Int. Cl.² F16H *73/06, 57/00*

U.S. Cl. 74—665 B **4 Claims**



1. A driving gear assembly comprising, in combination, a driving shaft, a driving gearwheel on said shaft, at least two intermediate shafts arranged in parallel with their axes in a common plane, the driving shaft axis being offset to one side of said common plane and respective gearwheels on said intermediate shafts meshing with the driving gearwheel, radial support bearing means for said driving shaft comprising means permitting displacement of the shaft axis substantially perpendicularly to the resultant force of two equal forces applied to the driving shaft gearwheel by the intermediate shaft gearwheels, said means permitting displacement comprising at least one element pivotally mounted in said bearing means and

on which the driving shaft is supported to be pivotable about an axis parallel to the shaft axis in response to relative changes of the forces acting between the driving gearwheel and the intermediate shaft gearwheels for automatic adjustment of the position of the shaft in a direction transverse to its axis to equalise the load distribution between said intermediate shafts, said pivoting axis for the driving shaft being disposed on a line passing through the shaft axis and parallel to the direction of said resultant force.

3,905,251

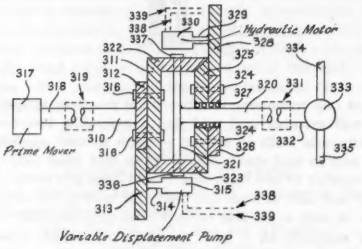
HYDRO-MECHANICAL VARIABLE RATIO TRANSMISSION METHOD AND APPARATUS

Clarence Kirk Greene, 100 N. Arlington, Reno, Nev. 89501

Filed May 6, 1974, Ser. No. 466,873

Int. Cl.[2] F16H *47/04*; F15B *15/18*

U.S. Cl. 74—687 **4 Claims**



1. A power transmission comprising: a bevel gear differential consisting of a first pair of parallel bevel gears at a spaced distance from one another, a second pair of parallel bevel gears in driving engagement with said first pair of bevel gears, and at a perpendicular relationship thereto, said second pair of bevel gears being carried by a carrier, and journaled on a first and second shaft upon said carrier; a third shaft connected to said carrier; a first spur gear connected to one of said bevel gears, said first spur gear and the bevel gear to which it is connected being journaled upon said third shaft; a second spur gear fastened to said other member of said first pair of bevel gears; a fourth shaft fastened to said second spur gear; a third spur gear in driving contact with said first spur gear; an hydraulic motor connected to said third spur gear; a fourth spur gear in driving connection with said second spur gear; a variable displacement hydraulic pump connected to said fourth spur gear; hydraulic connections between said hydraulic pump and said hydraulic motor; input power means connected to said fourth shaft; and power load means connected to said third shaft.

3,905,252

AUTOMATIC PLANETARY GEAR CHANGE-SPEED TRANSMISSION FOR MOTOR VEHICLES

Wolfgang Zaiser, Althutte, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

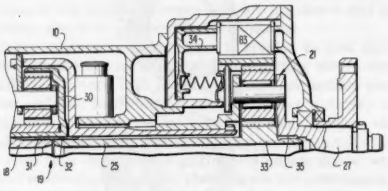
Filed Nov. 28, 1973, Ser. No. 419,712

Claims priority, application Germany, Nov. 28, 1972, 2258137

Int. Cl.[2] F16H *57/02*, *57/10*

U.S. Cl. 74—759 **29 Claims**

1. An automatic change-speed transmission for motor vehicles which includes a basic transmission means providing three speeds and prepared for the connection with an auxiliary gear means, a uniform housing means for the basic transmission means, and control means within said housing means for the operation of the transmission, characterized in that the housing means of the basic transmission means is provided on the output side inwardly thereof with a sleeve-like extension means and outwardly thereof with a flange means for the emplacement and fastening of a first auxiliary housing means, said basic transmission means including an input shaft and an output shaft, said output shaft being constructed as hollow shaft for extending therethrough an input shaft of a first auxiliary gear means, said hollow output shaft of the basic transmission means being adapted to be closed at the end thereof by a detachable sealing plug means, the input shaft of the basic transmission means being provided at its end facing its output with a plug-type connection means for the connection of the input shaft of a first auxiliary gear means.



3,905,253

TRANSMISSION ASSEMBLY

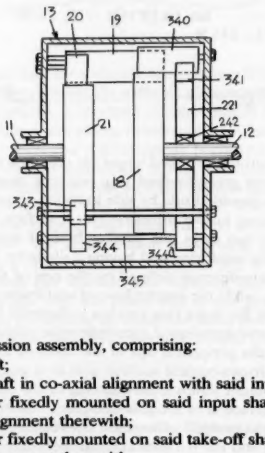
Harry Stirland, Birch House, Victoria St., Gedling, England

Filed Apr. 10, 1973, Ser. No. 349,753

Claims priority, application United Kingdom, Apr. 13, 1972, 17036/72

Int. Cl. F16h *1/28*

U.S. Cl. 74—803 **6 Claims**



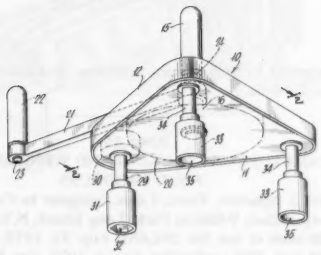
1. A transmission assembly, comprising:
an input shaft;
a take-off shaft in co-axial alignment with said input shaft;
a first gear fixedly mounted on said input shaft and in co-axial alignment therewith;
a second gear fixedly mounted on said take-off shaft and in co-axial alignment therewith;
a transmission element rotatably mounted on said input and take-off shafts;
at least one gearing arrangement rotatably carried by said transmission element, each at least one gearing arrangement meshing with said first and second gears;
restraining means for controlling the rate of rotation of said transmission element so as to regulate the speed of rotation of said take-off shaft;
wherein said restraining means comprises an additional gearing assembly including at least one further gearing arrangement rotatably mounted in said transmission element, the additional gearing assembly being adapted to develop a torque to approximate the rotation of the transmission element;

a third gear fixedly mounted on said take-off shaft in coaxial alignment therewith;
a fourth gear fixedly mounted on an output shaft in coaxial alignment therewith;
said transmission element being rotatably mounted on said input, take-off, and output shafts respectively; and
each further gearing arrangement being similar to said at least one gearing arrangement and serving to provide a driving connection between said third and fourth gears.

3,905,254
LUG NUT REMOVER

Leonard Palatnick, West Nyack, N.Y., and Robert L. Shiner, Lakewood, N.J., assignors to Leonard Palatnick, West Nyack, N.Y.

Filed June 10, 1974, Ser. No. 477,617
Int. Cl.² B25B *17/00*
U.S. Cl. 81—57.3 **8 Claims**

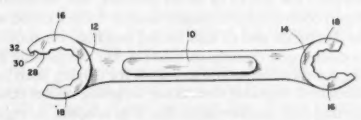


1. A tool for loosening or tightening of lug nuts such as those of vehicle wheels comprising a tool body, a rotatable socket member on a shaft extending forwardly from said tool body, means for rotating said shaft and said rotatable socket member, and two stabilizing socket elements, fixed in position during operation and extending forwardly of said tool body so that when the rotatable socket member engages a lug nut said stabilizing socket elements engage other lug nuts to stabilize the position of the tool during operation, said rotatable socket member having a hexagonal-shaped socket for receiving a hexagonal lug nut and said tool body having spaced, parallel, flat front and rear faces.

3,905,255
COMBINATION TORQUEING AND RATCHETING WRENCH FOR 12-POINT MEMBERS

James P. Evans, Oklahoma City, Okla., assignor to Paul H. Johnson, Tulsa, Okla.

Filed Jan. 7, 1974, Ser. No. 431,035The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.
Int. Cl.² B25B *13/46, 13/08*
U.S. Cl. 81—119 **4 Claims**

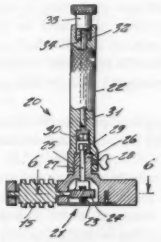


1. A combination torqueing and racheting wrench for a 12-point member having 24 equal sides and 12 symetrical projections symmetrical the peripheral surface, comprising:
a wrench body having a handle portion and spaced apart jaws providing a member receiving space therebetween, one of the jaws being a torqueing jaw and the other a backup jaw, the surfaces of the torqueing and backup jaws facing each other and the surface of the wrench body portion between the jaws facing the member receiving space being configured to snugly engage more than one half the peripheral surface of the member to be rotated whereby the wrench may be slidably axially positioned over a member to apply torque to the member by rotation of the handle relative to the member in either direction, the outer end of the jaws having an open space therebetween, the outer end of the torqueing jaw having a notch thereon dimensioned to receive one of the peripheral projections of the 12-point member to which the wrench is dimensioned, the notch being formed by an outer notch surface intersecting an inner notch surface at an angle of about 120°, the backup jaw having a planar ratcheting surface configured to engage one of the peripheral projections of the twelve point member, such projection of the 12-point member being spaced less than one half of the periphery of the member away from the projection received in said notch, the plane of backup jaw ratcheting surface intersecting the plane of said inner surface at an angle of about 90°.

3,905,256
ADJUSTABLE JAW RATCHET TYPE DRIVE TOOL

Donald E. Foley, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Apr. 15, 1974, Ser. No. 460,775
Int. Cl.² B25B *13/14*
U.S. Cl. 81—165 **4 Claims**

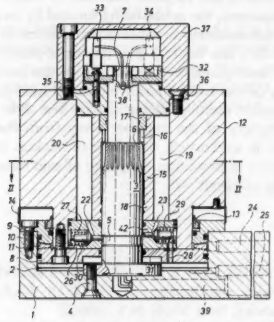


1. An adjustable jaw type wrench comprising a fixed jaw and a longitudinally movable jaw mounted slidably on said fixed jaw, said jaws having opposing parallel gripping surfaces spaced at a variable distance, said fixed jaw including a worm gear rotatable about an axis perpendicular to said surfaces, said gear being mounted in an aperture extending transversely through said fixed jaw, in combination with a rack on said movable jaw, wherein the longitudinal axis of the rack is aligned with the approximate center of the wrench, in further combination with an adaptor fitting having an axis extending at right angles from the intersection of the rack axis and a line equidistant from the gripping surfaces, said intersection being the approximate center of the wrench, said fitting being adapted to receive a rotary driving tool wherein a scale is provided on the fixed jaw adjacent and at right angles to said surfaces, and wherein said fixed jaw has a slot which receives the rack therein for guiding purposes and further wherein said jaws are of equal thickness and said rack are in snug interlocking relationship, wherein said worm gear is integral with a first spiral gear engaging a second spiral gear integral with a first shaft rotatable inside and along an axis of said adaptor fitting.

3,905,257
TOOL ROTATING DEVICE

Helmut Thumm, and Hans Kettel, both of Metzingen, Germany, assignors to Willy Sauter KG, Germany

Filed Sept. 10, 1974, Ser. No. 504,841
Claims priority, application Germany, Sept. 15, 1973, 2346626
Int. Cl.[2] B23B *29/24, 29/32*
U.S. Cl. 82—36 A 8 Claims



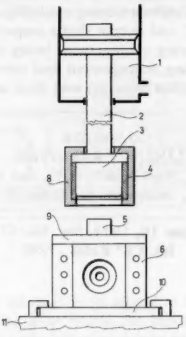
1. A tool rotating device comprising:
a fixed central pivot member;
a holding body concentrically surrounding said fixed central pivot member and spaced therefrom to define an annular chamber;
tool means attached to said holding body;
rotary piston means disposed in said annular chamber; said rotary piston means including a pair of arcuate pistons;
a cylindrical member disposed in said annular chamber between said pistons and central pivot member;
one of said pistons being fixed to said cylindrical member and the other of said pistons being fixed to said holding body;
means for shifting said pistons, holding body and cylindrical member axially with respect to said central pivot member;
said cylindrical member having internal gear teeth and said central pivot member having external gear teeth, said internal and external teeth being engaged when said cylindrical member is shifted axially in one direction with respect to said central pivot member and being disengaged when said cylindrical member is shifted axially opposite to said one direction;
said means for shifting comprising fluid pressure means including a flow circuit by which fluid under pressure is delivered to said annular chamber to rotate said piston fixed to said holding member, and to thus rotate said holding member and said tool means attached thereto.

3,905,258
METHOD OF AND APPARATUS FOR HIGH SPEED SHEARING OFF OF WORKPIECES

Istvan Nagy; Pal Sulyok; Ivan Vas, and Istvan Viragh, all of Budapest, Hungary, assignors to Novex RT., Budapest, Hungary

Filed Oct. 2, 1973, Ser. No. 402,726
Claims priority, application Hungary, Oct. 4, 1972, GE 926
Int. Cl. B23d *15/04;* B26d *3/20*
U.S. Cl. 83—13 2 Claims

1. A method of shearing off a workpiece between a fixed tool and a cooperating movable blade actuated by a high speed ram, comprising moving the ram and movable blade together until the movable blade has cut through about 10% of the thickness of the workpiece in the direction of shearing, braking the ram, and continuing the movement of the movable blade beyond the ram until the movable blade has covered a

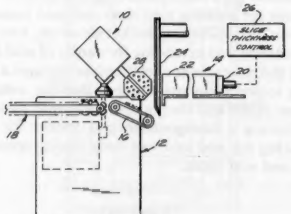


distance up to 50% of said thickness, and then braking the movable blade.

3,905,259
APPARATUS FOR STACKING AND WEIGHING SLICED FOOD PRODUCTS

Robert J. Spooner, Essex, Conn., assignor to Cashin System Corporation, Williston Park, Long Island, N.Y.

Division of Ser. No. 282,651, Aug. 22, 1972, Pat. No. 3,835,742. This application Apr. 2, 1974, Ser. No. 457,195
Int. Cl.[2] B26D *4/46;* G01G *13/22*
U.S. Cl. 83—77 2 Claims



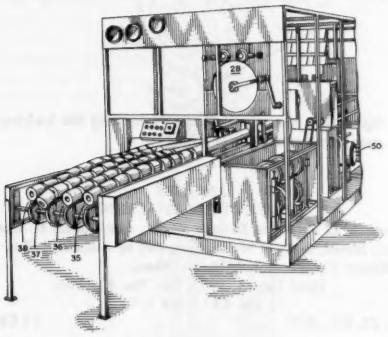
1. In combination a slicing machine having a slicing blade, a feeding means for feeding the product to be sliced into said blade and control means for determining the rate of advance of said feeding means towards said blade, and consequently, the sliced thickness; apparatus for stacking slices of said products as they are discharged by said slicing machine and then transferring the stacks of sliced product, said apparatus comprising in combination a paddle stacker to be located adjacent to the discharge end of said slicing machine for receiving the slices discharged therefrom, said stacker comprising a pair of mating paddles connected to means for driving each paddle in synchronized opposite directions; weighing means operatively supporting said stacker such that it is adapted to register the weight of the sliced product being stacked thereon; stacker actuating means coupled with said stacker for actuating said driving means to rotate said paddles in opposite directions to transfer the stack of slices of said product and ready said stacker for reception of another stack of slices; stack receiving means and conveying means in stack receiving position adjacent said stacker, and being adapted to receive thereon the stacks of sliced product transferred by said stacker.

3,905,260

LOG SAWING SYSTEM

Ernst D. Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Sept. 6, 1974, Ser. No. 500,293
Int. Cl. B26d 3/16, 7/12
U.S. Cl. 83—155 1 Claim



1. A log transport and cutting mechanism comprising a frame,

a bucket conveyor on said frame arranged and constructed to travel in a loop, each bucket being relatively elongated and adapted to receive a log in one part of said loop and dump said log in another part of said loop whereby a log in travelling from said one loop part to said another loop part travels through a first path,

means adjacent said loop one part for feeding logs to said conveyor for each bucket, sensing means in said frame actuatable by a log in a bucket approaching said loop one part to prevent a log being fed to said conveyor for the last mentioned bucket,

a pusher system on said frame for advancing logs in a second path generally perpendicular to said first path, said system including at least four parallel guide lanes for the receipt of logs dumped thereinto from buckets travelling in said first path, each lane having an endless chain mounted therebelow and equipped with a plurality of pushers adapted to project into the associated lane for axially advancing a log, a rotating disk saw orbitally mounted on said frame to pass transversely and sequentially through logs in said lane, said lanes being arranged with a pair on each side of the nadir of said orbit with the outer of each pair being higher than the inner, and with the inner of each pair being horizontally aligned, collar means in each lane for confining a log therein just prior to engagement with said saw,

drive means for said saw and chains comprising a motor-powered line shaft mounted on said frame, a cam indexing unit for each of said saw and four chains coupled to said line shaft and deriving rotational power therefrom, said chain cam indexing units being arranged and constructed to index first that chain associated with the outer lane log first engaged by said saw during an orbit, next the two chains in the inner lanes of each pair and thereafter the chain associated with the outer lane, and

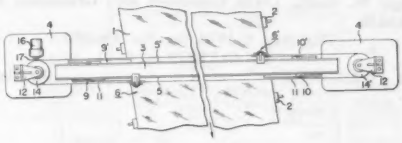
means operably associated with each lane for increasing the speed of the severed log portion to assist in removal of log trim.

3,905,261

APPARATUS FOR SCORING A STRIP OF GLASS SHEET

Teruo Okuyama, Tsu, Japan, assignor to Central Glass Co., Ltd., Ube, Japan

Filed May 22, 1974, Ser. No. 472,128
Claims priority, application Japan, May 31, 1973, 48-60352
Int. Cl.² C03B 33/02
U.S. Cl. 83—11 8 Claims



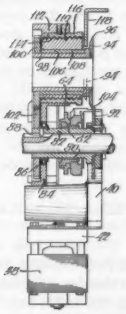
1. An apparatus for scoring a moving strip of glass sheet, comprising a set of cutters capable of reciprocating motion along a set of guide rails so installed as to stretch over said moving strip of glass sheet, said cutters touching and scoring the strip of glass sheet at the time of forward stroke and being parted from the strip of glass sheet to return to the original position thereof without scoring the strip of glass sheet at the time of backward stroke, the set of guide rails including two guide rails, one being in front and the other in the rear relative to the direction of movement of the strip of glass sheet, and said set of cutters including two cutters, each being mounted on the respective guide rail to be capable of reciprocating motion along the guide rail simultaneously and in opposite directions in such a fashion that when one cutter reaches the terminal point for scoring the other cutter reaches the starting point for scoring, and said two cutters being interconnected by means of a chain, said chain being devised as to be operated by means of a drive device.

3,905,262

TRIMMER BLADE THROW-OFF MECHANISM

Howard P. Stromberg, Antioch, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Continuation-in-part of Ser. No. 426,453, Dec. 20, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 495,065
Int. Cl.² B26D 7/06, 19/00
U.S. Cl. 83—425.2 7 Claims



1. In a continuous business forms stationary processing apparatus, the combination comprising:

means defining a path of stationery travel through said apparatus;

means for driving stationery through said apparatus along said path; and

means for trimming at least one longitudinal edge of the stationery including a pair of rotary driven knives adapted to be in substantially peripheral contact with each other

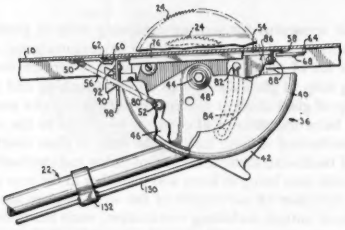
to define a cutting nip along one edge of said path, means mounting said knives for axial and radial movement relative to each other, and means, including a single actuator for simultaneously effecting said axial and radial relative movement.

3,905,263

TABLE MOUNTING FOR PORTABLE POWER SAW

Roger W. Smith, 13120 Grandview Rd., Grandview, Mo. 64030

Filed Aug. 9, 1974, Ser. No. 496,050
Int. Cl.² B27B *5/24*
U.S. Cl. 83—477.2 **10 Claims**



1. Convertible saw apparatus comprising:

a power-operated, normally hand-held saw having a baseplate, a rotary blade adjustable with respect to said baseplate, a drive for the blade, a handle, and an actuator on the handle for rendering the blade drive operational;

portable table structure provided with a tabletop having a clearance opening therein for receiving said blade;

a quick-release mount on the underside of said tabletop engageable with said baseplate for rigidly securing the baseplate to the tabletop with said blade extending upwardly through said opening, whereby the hand-held saw may be converted into a table saw;

a control arm having opposed, inner and outer ends;

releasable means connecting said inner end of the arm to said handle with the arm extending outwardly beneath said tabletop to locate the outer end portion thereof where it may be conveniently grasped by an operator for adjustment of the position of said blade; and

manually operable mechanism on said arm engageable with said actuator for operating the latter when the arm is connected to said handle and having a control linkage extending along said arm to said outer end portion thereof, whereby to permit the operator to selectively control the operation of the blade drive when the apparatus is employed as a table saw.

3,905,264

SLITTING WHEEL HOLDER

Frank M. Eddy, 1294 Roselawn, Thousand Oaks, Calif. 91360

Filed Aug. 30, 1974, Ser. No. 501,994
Int. Cl.² B26D *1/16*
U.S. Cl. 83—481 **20 Claims**

1. A holder for a slitter wheel having a central hole, comprising:

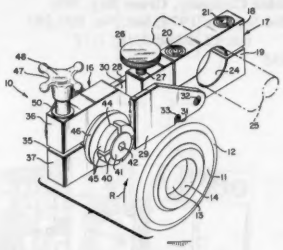
a. a holding block formed with a retention opening;

b. a housing positioned in the retention opening of the holding block;

c. bearing means carried within the housing;

d. a sleeve engaged with the bearing means and disposed for rotation within the housing;

e. a locking element on the sleeve and capable of being positioned in the central hole of the slitter wheel; and,



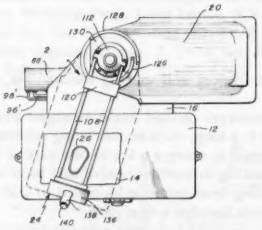
f. tightening means for releasably locking the locking element against the slitter wheel.

3,905,265

DIE CUTTING MACHINE

Raymond L. Peterson, Beverly Farms, and Robert H. Garritt, Jr., Dover, both of Mass., assignors to American Shoe Machinery Corporation, Woburn, Mass.

Filed Dec. 3, 1973, Ser. No. 421,274
Int. Cl.² B26F *1/40*
U.S. Cl. 83—537 **14 Claims**



1. A die cutting machine comprising:

a frame;

a cutting table supported on said frame;

an impact member supported by said frame;

means mounting said impact member for movement between a working position over said cutting table to enable said impact member to be disposed over substantially any selected region of said cutting table and a position remote from said working position;

first drive means for effecting said movement of said impact member between said working an remote positions;

means mounting said impact member for movement toward and away from said cutting table;

second drive means for effecting said movement of said impact member toward and away from said cutting table;

a control member mounted to said machine for movement between a range of positions which are analogous to the range of working positions of said impact member relative to said cutting table;

means for sensing a difference between the relative analogous positions of said control member and said impact member with respect to said cutting table, the sensing means including means for controlling the operation of said first drive means; and

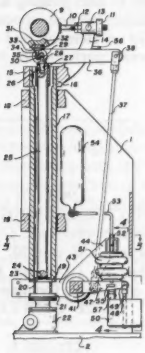
manually actuable control means operative independently of movement of said control member and being operatively associated with said sensing means to cause the sensing means to operate said first drive means to move said impact member to a working position with respect to

said cutting table which is analogous to the position of said control member.

3,905,266
BANDMILL STRAIN SYSTEM

Jack Weavell, New Westminster, and James H. Porter, North Vancouver, both of Canada, assignors to CAE Machinery Ltd., Vancouver, Canada

Filed Mar. 7, 1973, Ser. No. 338,895
Int. Cl.² B27B *13/08*; B26D *1/46*; B23D *55/10*
U.S. Cl. 83—819 **14 Claims**

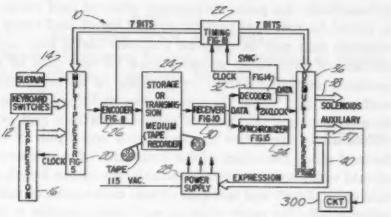


1. A bandmill, comprising
— a frame,
— first and second bandwheels for receiving and guiding a bandsaw,
— first and second pairs of journals respectively journalling said first and second bandwheels,
— means fixedly mounting said first pair of journals in said frame,
— a pair of jacks each independently supporting one each of said second pair of journals,
— a pair of torque bars each having two offset oppositely facing recesses,
— a first pair of knife edged members each mounted on one of said jacks and engaging in one recess in one of the torque bars,
— a second pair of knife edged members each mounted on one of said second journals and engaging in the other recess in one of the torque bars,
— a pair of rocker arms each secured so as to project radially from one of said torque bars for rotation therewith,
— a pair of bracket members mounted on and extending in parallel relation one each from each of said jacks,
— a cross shaft mounted for rotation between said bracket members,
— a pair of levers extending from said cross shaft adjacent each end thereof for rotation therewith
— a pair of links each connecting a rocker arm to one of said levers,
— an actuating lever extending from said cross shaft at a central position,
— a bridge member extending across said bracket members above said actuating lever, and
— a gas spring secured between said actuating lever and said bridge member whereby pressurization of the gas spring causes simultaneous rotation of said torque bars to increase the spacing of said second journals from said jacks.

3,905,267
ELECTRONIC PLAYER PIANO WITH RECORD AND PLAYBACK FEATURE

Raymond A. Vincent, 9307 Marion Cres., Detroit, Mich. 48239

Filed Feb. 4, 1974, Ser. No. 439,147
Int. Cl.² G10F *1/00*, *5/00*
U.S. Cl. 84—115 **13 Claims**

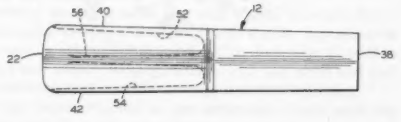


1. An electronic data storage and retrieval system for use in operating an electronic player piano having selectively actuable key depression devices comprising: storage means containing a self-clocking data signal comprising a series of time frames each containing a serial waveform comprising first and second signal levels and relatively abrupt coded transitions between said levels wherein the pattern of said transitions in a given frame represent the status of individual keys at a given instant in time during the production of a musical presentation, means for decoding the data signal in a first decoding process to a square waveform characterized by only two discrete signal levels and being divisible into clock times wherein the levels at the individual clock times represent the key conditions at the sample time; means for producing a second decoding step for cyclically reconverting the serial data into parallel form, and means for applying the data as reconverted to said key depression devices to reproduce the recorded musical production.

3,905,268
REEDS FOR SAXOPHONES, CLARINETS AND OTHER WOODWINDS

John G. Gamble, 75 Library Ln., Simsbury, Conn. 06070

Filed May 14, 1974, Ser. No. 469,831
Int. Cl.² G10D *9/02*
U.S. Cl. 84—383 **5 Claims**



1. A reed for use in a reed blown musical instrument comprising a relatively thin, elongated member formed of synthetic material having a transversely extending shoulder formed intermediate the ends thereof along the top surface thereof, said member including a heel portion formed at one end thereof extending from said shoulder to one of the free ends of said member and a vamp section formed at the other end thereof extending from said shoulder to the other one of the free ends of said member, said heel portion including a substantially flat, planar surface cooperable with the mouthpiece of the musical instrument for mounting the reed thereto, said vamp section including a lower surface operable as the face of the reed and a curved upper surface cooperable with said lower surface to provide said vamp section with an arched shape in cross section taken substantially perpendicular to the major axis of said vamp section, said upper surface of said

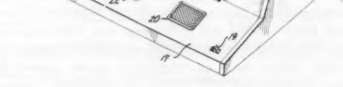
vamp section being tapered so as to provide said vamp section with a decreasing thickness and a corresponding diminishing mass extending from said shoulder to a point spaced therefrom whereat said lower surface and said upper surface blend together to define the tip of said vamp section, said lower surface of said vamp section having a pair of spaced relieved portions formed therein in substantially parallel relation to each other and extending longitudinally substantially the entire length of said lower surface of said vamp section from substantially the point therealong whereat said vamp section is joined to said heel portion to said tip of said vamp section wherein said pair of relieved portions blend into said lower surface of said vamp section, each of said pair of relieved portions embodying the configuration of an arch, said lower surface of said vamp section further including a central web formed between said pair of relieved portions and extending substantially the entire length thereof and a pair of side rails formed along the edges of the long sides of said lower surface of said vamp section for substantially the entire length thereof, said central web and said pair of side rails each extending from substantially the point whereat said vamp section is joined to said heel portion to said tip of said vamp section, said central web and said pair of side rails each embodying a uniformly decreasing taper so as to blend into said lower surface of said vamp section at said tip thereof, said pair of relieved portions, said central web and said pair of side rails all cooperating mutually together to provide the reed with an area moment of inertia that decreases uniformly from said shoulder of said member to said tip of said vamp section and with the predominant distribution of inertial mass of the reed which is coincident with the predominant axial stiffness thereof being located centrally of the longitudinal axis of said vamp section.

3,905,269

ELECTRONIC RHYTHM-TEACHING MACHINE

David P. Doerksen, 15550 S.W. Burntwood Ct., Beaverton, Oreg. 97005, and Paul I. Bennett, Rt. 2, Box 180B, McMinnville, Oreg. 97128

Filed July 12, 1973, Ser. No. 378,655
Int. Cl.[2] G09B *15/08*
U.S. Cl. 84—470 **16 Claims**



1. In a rhythm teaching system employing masking means for displaying a musical rhythmic sequence to be performed and for storing information concerning the correct performance of said sequence, said masking means having musical elements of said sequence displayed thereon, display light-transmissive regions therein associated with said elements, and having storage means for storing programming information on said masking means, said information corresponding to correct performance of the beginnings and endings of said musical elements, a rhythm teaching machine comprising

performance input means for receiving a student's performance of said sequence,

means for holding and positioning said masking means in said machine,

display light means including a plurality of lights, one associated with and viewable through each of said display light-transmissive regions in said masking means when the same is positioned in said machine,

sensing means for reading the programming information stored on said masking means,

program storage means responsive to said sensing means for storing said programming information in said machine,

means operatively coupled to said storage means and responsive to the program information stored therein for generating time sequenced information corresponding to a correct performance of said musical sequence,

judging means responsive both to said performance input means and to said generating means for comparing the student's performance of musical elements in said sequence with said time sequenced information to determine the correctness of the student's performance, and

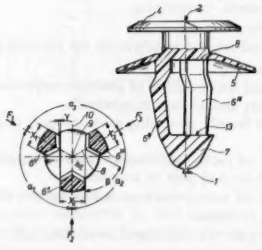
means responsive to said judging means for actuating said lights to indicate, by one appearance state, a correct performance of an element, and by another appearance state, an incorrect performance of that element.

3,905,270

ONE-PIECE FASTENING ELEMENT

Klaus Friedrich Hehl, Norderstedt, Germany, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 10, 1974, Ser. No. 487,352
Claims priority, application Germany, July 11, 1973, 25503
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—5 R **4 Claims**



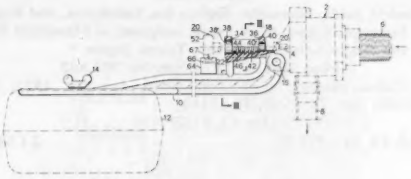
1. A one-piece fastening element made from synthetic material which is adapted to be inserted in a fastening aperture of a complementary workpiece in a self-retaining manner, comprising a head adapted to lie in close proximity to one side of the complementary apertured workpiece and a shank extending from said head and adapted to be introduced into the fastening aperture, said shank consisting of three spring legs formed integrally with the head and united at their terminal end to form an entering end portion, said three spring legs each provided with a step-like shoulder intermediate said head and said entering end portion adapted to engage the surface of the complementary apertured workpiece opposite the surface engaged by said head, said legs being pentagonal in cross-section from the vicinity of said head portion to the terminal entering portion and diminishing in cross-sectional area in the same direction, the pentagonal peak of each of said legs facing inwardly in the direction of the axis of the fastener, said three legs being separated by slots in said shank which have a circumferential dimension at least equal to the circumferential measurement of each of said legs.

3,905,271

NUT CONSTRUCTION SCREW ASSEMBLY AND VALVE ACTUATOR UTILIZING SAME

Moshe Leczycki, Tel Aviv, Israel, assignor to Plasson Maagan Michael Industries Limited, Menasche, Israel

Filed Feb. 19, 1974, Ser. No. 443,856
Claims priority, application Israel, Feb. 26, 1973, 41625
Int. Cl.[2] F16B *37/00*
U.S. Cl. 85—32 V 5 Claims



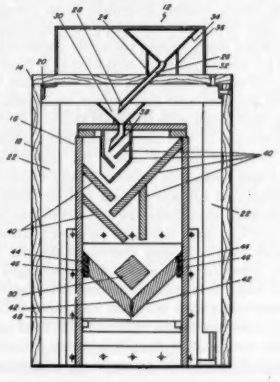
1. A nut construction comprising a body member formed with a cylindrical bore extending longitudinally therethrough, and with a cut-out communicating with the bore and extending radially therefrom through one face of the body member intermediate its end, said cut-out intersecting the bore along a pair of parallel planes substantially tangential to the bore and perpendicular to the transverse axis thereof, the portion of the bore coextensive with said cut-out being formed with a plurality of spiral threads, the portions of the bore extending through the ends of the body member being unthreaded.

3,905,272

MUNITION DESTRUCT APPARATUS

Bobby Dean Johnson, Burlington, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 15, 1974, Ser. No. 451,403
Int. Cl.[2] F42B *33/00*
U.S. Cl. 89—1 R 5 Claims



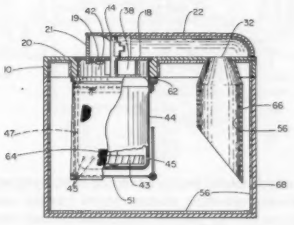
1. A munition destruct apparatus comprising:
- a housing;
- a heat and sound insulating partition in said housing;
- an inner housing fixed within said housing;
- a chute in said housing and said inner housing permitting communication;
- baffle plates within said inner housing to convey items downward in a guided fashion;
- transverse plates, within said inner housing and forming an apex below said baffle plates, spaced and electrically insulated from each other and adapted to be electrically charged to act as a circuit breaker; whereby a munition placed in said chute of said housing will fall by gravity past said baffle plates on to the apex of said transverse plates closing the electrical circuit causing the munition to detonate.

3,905,273

MACHINE TOOL ASSEMBLY

Gerald Shook, Huntington Station, N.Y., assignor to Shyodu Precision Instrument Company, Brooklyn, N.Y.

Filed July 22, 1974, Ser. No. 490,758
Int. Cl.[2] B23C *1/06*; B27G *3/00*, *21/00*
U.S. Cl. 90—11 R 5 Claims

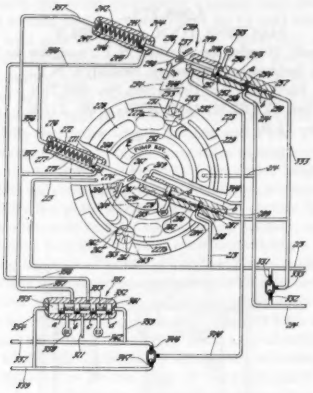


1. In a machine tool assembly of the type having a machine tool with a motor housing for enclosing a stator surrounding a rotor which is mounted on a shaft and a fan also mounted on said shaft to provide a flow of cooling air for said rotor and said stator from a plurality of cooling air holes in said motor housing whereby said flow of cooling air is discharged axially between said rotor and said stator and through one end of said motor housing, one end of said shaft having a tool attached to said shaft and protruding through said one end of said motor housing, the improvement comprising:
- a housing having a table top with a first aperture therethrough and a lower shell, said table top having means for mounting said motor housing on the underside thereof so that said motor housing extends into said shell and said protruding tool extends through said first aperture;
- filtering means attached to the underside of said table top and enclosing said motor housing;
- a second aperture through said table top and spaced from said first aperture;
- a hollow tool guide mounted on the top surface of said table top and having one end positioned over said second aperture and another end justaposed to said first aperture to provide communication thereinbetween, said table top having passageways therein for communicating with said first aperture and one exterior end of said table top;
- tube means connected to said second aperture on the underside of said table top and extending into said shell whereby rotation of said rotor will cause cooling air to be drawn by said fan through said hollow tool guide and said tube means, into the interior of said shell whereby filtered cooling air passes through said filtering means axially through said motor housing and through said first aperture into said passageways where it is discharged through said exterior end of said table top.

3,905,274
ROTARY TIMING VALVE

Nils P. Week, Allen Park; Carl E. Shellman, and Erkki A. Koivunen, both of Livonia, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1974, Ser. No. 437,475
Int. Cl.[2] F01B *13/04*
U.S. Cl. 91—6.5 39 Claims

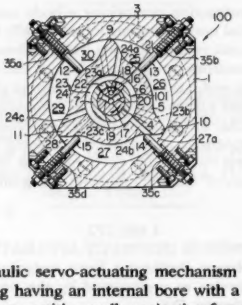


1. In a hydrostatic pump or motor unit; hydrostatic displacement means including stator means having cam means and rotor means having pistons and cylinders mounted for relative reciprocation by said cam means between a top and bottom dead center position at top and bottom dead center positions of said rotor means during rotation of said rotor means; said stator means having a planar annular valve face having adjacently arranged in annular sequence in one rotary direction a first dead center closure surface portion, a first transition surface portion having a first timing valve means, a first main port portion, a second dead center closure portion, a second transition surface portion having a second timing valve means and a second main port portion with each portion having one end adjacent the preceding portion and the other end adjacent the following portion; said rotor means having an annular port face in surface sealing rotary contact with said valve face having an annular series of cylinder ports; each cylinder port being connected to a cylinder and traversing said valve face portions during rotation in said one direction in the same sequence and during rotation in the opposite direction in the opposite sequence and being closed when in full registry at each dead center surface portion at the same point of said rotary movement and open at each main port portion; each timing valve means providing a progressively variable length passage between a variable transition point in each transition surface and the one end of the adjacent main port portion dividing the transition surface portion into an essentially planar progressively variable length pressure change surface portion extending to the other end of the adjacent dead center portion and an inversely progressively variable length port extension portion extending to the one end of the adjacent main port portion operative to continuously close each cylinder port during cylinder port movement over said pressure change portion providing a stroke induced cylinder pressure change and to continuously open each cylinder port to said adjacent main port portion during cylinder port movement over said port extension portion and said timing valve means progressively movable to a minimum position to lengthen said passage and move said transition point toward said adjacent dead center portion for minimum pressure change movement and pressure change and to maximum position to shorten said passage and move said transition point toward said adjacent main port portion for maximum pressure change movement and pressure change and control means operatively connected to said timing valve means to control said timing valve means to control the amount of pressure change to make the cylinder pressure substantially equal to main port pressure at the transition point for equalized pressure interconnection.

3,905,275
HYDRAULIC CONTROL VALVE FOR ROTARY SERVO-ECHANISM

Youichi Saida, Kawasaki; Hajime Ito, Yokohama, and Kojiro Imanaga, Tokyo, all of Japan, assignors to Mitsubishi Kinzou Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1973, Ser. No. 354,882
Claims priority, application Japan, Apr. 28, 1972, 47-42243; Apr. 28, 1972, 47-42244
Int. Cl. F15B *9/10*
U.S. Cl. 91—375 R 2 Claims

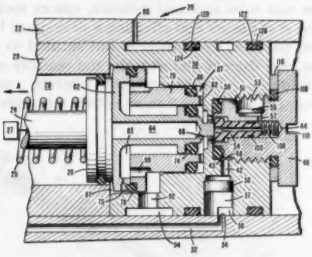


1. A hydraulic servo-actuating mechanism comprising an annular casing having an internal bore with a central axis; a plurality of first partition walls projecting from the inner surface of said bore radially inwardly toward said central axis of the casing; end walls closing the axial ends of said bore; an input shaft extending axially through said bore and rotatably positioned therein for rotation around said central axis, said input shaft having therein hydraulic fluid passages connected to a hydraulic pressure source and to a hydraulic fluid reservoir; an output shaft means rotatably mounted on the outer periphery of said input shaft and having a rotor thereon with a plurality of second partition walls which are wedge-shaped projections integral with said output shaft radially outwardly projecting therefrom with the ends thereof slidingly engaging said inner surface of said casing, said first partition walls being movably mounted in said casing for radial back and forth movement and resiliently urged radially inwardly against the outer perhipheral surface of said output shaft, whereby hydraulic actuating chambers are formed in the casing between adjacent pairs of said first and second partition walls, said output shaft means having therein hydraulic fluid passages selectively communicating said fluid passages in said input shaft with said hydraulic actuating chambers; and control valve means interposed between said input and output shafts to control communication between said fluid passages in said input shaft and said hydraulic actuating chambers in said casing through said fluid passages in said output shaft, said control valve means comprising mounting means for slidably mounting said input shaft for sliding movement along said central axis relative to said output shaft means, a liner sleeve interposed between said input and output shafts and secured to said output shaft so as to be rotatable therewith, a first set of fluid flow control openings in the outer surface of said input shaft communicating with said fluid passages in said input shaft, and a second set of fluid flow control openings in the inner surface of said liner sleeve communicating with said fluid passages in said output shaft means, one of said first and second sets of openings being ports and the other being grooves extending obliquely relative to said central axis.

3,905,276
MULTIPLE SPOOL POWER PACK UNIT

Douglas G. Nolles, New Canaan, and Graham W. Bryan, Ridgefield, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.

Filed Sept. 29, 1972, Ser. No. 293,469
Int. Cl. F15b *13/04*
U.S. Cl. 91—398 14 Claims



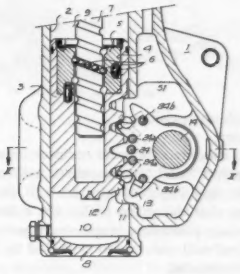
1. A gas powered driving unit for converting gas pressure into rectilinear motion in a drive shaft, the unit comprising a main casing, a piston chamber having an abutment surface at one end thereof, piston means including a drive shaft mounted for reciprocation in said piston chamber, an inlet valve body mounted in said main casing adjacent said piston means, said inlet valve body defining a spool chamber and a valve chamber interconnected by a port, spool means slidably mounted in said spool chamber, said spool means comprising a primary spool body and a secondary spool body, each said body being capable of independent movement within said spool chamber, valve means mounted in said valve chamber, gas feed means leading to said valve means for the introduction of pressurized gas, said valve means being constructed to convey gas from said gas feed means into said spool chamber, said primary spool body being slidably mounted in said spool chamber and in one position sealing against said valve means to effect the sealing of said valve means stopping gas conveyance of said valve means, means biasing said primary spool body into said one position trigger means for unseating said primary spool body from said valve means and for enabling said pressurized gas to initially thrust said primary spool body and then said secondary spool body in the direction of said piston means until in contact with said abutment surface, and for introducing said pressurized gas to said piston chamber to thrust said piston means away from said spool means, said primary and secondary spool bodies being together returned by gas pressure into positions wherein said primary spool body seats against said valve means to intercept the passage of pressurized gas therethrough, and exhaust means disenabled when said piston means is thrust away from said spool means by said pressurized gas, and enabled to exhaust the gas from said piston chamber, whereby said piston means moves towards said spool means.

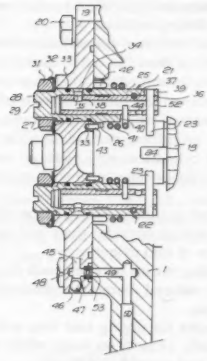
3,905,277
SERVO-ASSISTED STEERING MECHANISM

Jorge Estela Rosell, Barcelona, Spain, assignor to Bendeberica S.A., Spain

Filed Dec. 27, 1973, Ser. No. 428,841
Claims priority, application Spain, Jan. 13, 1973, 410896
Int. Cl.[2] F15B *15/22*
U.S. Cl. 91—400 8 Claims

1. In a servo-assisted steering mechanism, piston means having a pair of opposed ends and cylinder means having a hollow interior in which said piston means is slidable with said cylinder means providing at said ends of said piston means a pair of pressure chambers, respectively, one or the other of which is adapted to receive pressure for driving said piston means in said cylinder means in one direction or the other depending upon the direction of steering, said piston means forming one of a number of components of a transmission means for transmitting movement of said piston means to a steering mechanism, said transmission means including a portion of said piston means which is formed with rack teeth, and said components of said transmission means including a rotary gear sector meshing with said rack teeth and a shaft fixed to said gear sector for rotary movement therewith in one direction or the other depending upon the direction of movement of said piston means in said cylinder means, one of said components of said transmission means carrying a control projection which initially has a neutral position beyond which said control projection can freely move in one direction or the other without engaging any other elements, and a pair of





normally closed valve means for each providing when displaced to an open position communication between said chambers at said opposite ends of said piston for reducing a pressure differential between said chambers and thus terminating the operation of said transmission means, said pair of normally closed valve means respectively having connected thereto valve-actuating projections respectively situated on opposite sides of and in the path of movement of said control projection while being spaced from said control projection when the latter is in its neutral position, said control projection after moving in one direction or the other from its neutral position through a given distance engaging one of said valve-actuating projections for displacing the valve means connected thereto from its closed to its open position so as to provide communication between said chambers, so that until said control projection engages one of said valve-actuating projections said control projection can move freely without any restraint and after engaging one of said valve-actuating projections will continue to move until the valve means connected to the latter valve-actuating projection has been

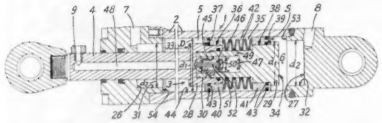
opened sufficiently to bring about a reduction in said pressure differential sufficient to terminate the operation of said transmission means.

3,905,278

MANUFACTURERS OF JACKS OPERATED BY HIGH PRESSURE FLUID

André P. Ourdouillie, Senlis, France, assignor to Poclain, Oise, France

Filed Feb. 26, 1974, Ser. No. 445,867
Claims priority, application France, Mar. 8, 1973, 73.8387
Int. Cl.² F15B *15/22*
U.S. Cl. 92—10 **10 Claims**



1. A jack comprising:
a cylinder;
a piston mounted for axial reciprocation in said cylinder;
a piston rod fixedly connected to said piston on a first end and having a second opposite end external of said cylinder so that the space within the cylinder is divided into two main chambers respectively positioned on opposite sides of said piston and bounded by the piston and the cylinder walls;
said piston including first and second shoulders having mutually facing surfaces;
reduced diameter cylindrical surface means between said mutually facing surfaces;
said reduced diameter cylindrical surface means having a diameter less than the outer diameter of said shoulders; an annular intermediate chamber extending about said piston between the facing surfaces of said shoulders;
a first cylindrical ring matingly mounted on said reduced diameter cylindrical surface adjacent said first shoulder; a second cylindrical ring matingly mounted on said reduced diameter cylindrical surface adjacent said second shoulder;
external sealing means provided on the outer surface of each of said cylindrical rings and engageable with the inner face of said cylinder;
internal sealing means between each of said cylindrical rings and said reduced diameter cylindrical surface means of said piston;
biassing means for urging said first and second cylindrical rings axially away from each other respectively toward said first and second shoulders;
a source of pressurized fluid; and
stuffing conduit means extending internally along the length of said piston rod and having one end communicating with said annular intermediate chamber and having an opposite end connected to said source of pressurized fluid.

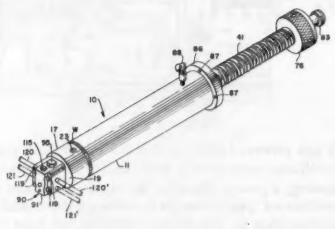
3,905,279

PISTON AND CYLINDER ASSEMBLY WITH EXTERNAL MECHANICAL LOCK

Donald E. Yadon, Hampton, Iowa, assignor to United Hydraulics Corporation, Hampton, Iowa

Filed Sept. 13, 1973, Ser. No. 396,857
Int. Cl.² F15B *15/24, 15/26*
U.S. Cl. 92—13.8 **10 Claims**

1. A double acting piston and cylinder assembly, comprising a cylinder, a piston means reciprocable in the cylinder, an elongate ram connected at one end thereof to the piston means for movement with the piston means and extending at its other end axially outwardly of the cylinder, an abutment means fixed in one end of the cylinder against which the piston means is engageable when in a fully extended position to limit further outward movement of the piston means and ram, said piston means and ram having an extended position with the piston means spaced a slight distance from said abutment means, a cylinder end cap fixed on the other end of the cylinder, a fluid supply and exhaust tube connected at one end thereof to said end cap and extending concentrically within said cylinder to a position adjacent said one end of the cylinder, said ram being cylindrical and concentrically disposed between said tube and said cylinder, spacer means fixed to said tube at the other end effecting a sliding seal between the tube and the ram, said piston means secured to said ram at said one end thereof and slidably and sealably engaged between said tube and said cylinder whereby extension and retraction chambers are formed within said cylinder, an adjustable safety stop means carried by the ram externally of the cylinder and manually movable along the length of the ram into engagement with an adjacent end of the cylinder to prevent retraction of said ram into said cylinder, and cooperating means on said safety stop means and said ram to limit inward movement of said safety stop means along said ram toward said cylinder, so that when said ram is in its fully extended position, with the piston means engaged with the abutment means, and said safety stop means is moved fully inwardly along said ram as limited by said cooperating means, said safety stop means is spaced from said cylinder, thus preventing jamming of said safety stop means against the end of the cylinder when said piston and ram are fully extended, and thereby enabling said safety stop means to be easily manually moved along said ram away from said cylinder and said ram can then be retracted into said cylinder.



3,905,280

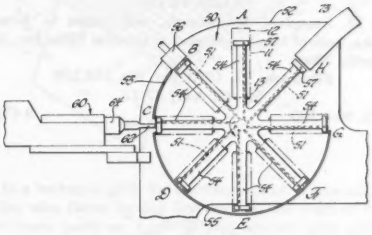
APPARATUS FOR WELDING THERMOPLASTIC COATED PAPERBOARD CARTONS

Harry B. Egleston, Livonia; Robert E. Lisiecki, Orchard Lake; Duncan J. Crawford, Franklin; Eric A. Bruan, Northville, and Earl W. Walke, Jr., Oak Park, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Filed Nov. 30, 1973, Ser. No. 420,427
Int. Cl.² B31B *1/66, 1/32*
U.S. Cl. 93—44.1 R **3 Claims**

1. Apparatus for welding at least two layers of thermoplastic coated paperboard together to form a sealed joint between the layers comprising: back-up means engageable with one outer surface of the paperboard layers; vibrating means engageable with the opposite outer surface of the paperboard layers when said other outer surface is engaged with said back-up means to heat the thermoplastic coating of the paperboard and weld the layers together; said back-up means being movable between operable and inoperable positions with respect to said vibrating means; said back-up means comprising an anvil engageable in its operable position with said one outer surface of the paperboard layers; said anvil being mounted for reciprocable movement between its operable and inoperable positions; said vibrating means movable between operable and inoperable positions with respect to the operable position of the back-up means; said vibrating means comprising a vibrat-

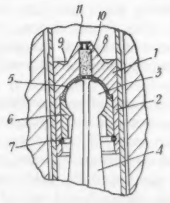
ing member reciprocably movable between positions defining the operable and inoperable positions of the vibrating means; said anvil and vibrating means being located at a welding station, and further including conveying means for conveying thermoplastic paperboard cartons having layers to be welded together past said welding station such that the layers to be welded together pass between said anvil and vibrating means; power means for moving said anvil and vibrating means between their respective operable and inoperable positions; carton operated actuating means for said power means, said actuating means being located adjacent said conveyor means and engageable by cartons on said conveying means for actuating said anvil and vibrating means to their respective operable positions when a carton is located at said welding station, and operable to actuate said anvil and vibrating means to their respective inoperable positions when a carton is not located at said welding station.



3,905,281
HYDRAULIC PISTONS

Robert Cecil Clerk, Edison House, Fullerton Rd., Glenrothes, Fife, Scotland

Filed June 15, 1973, Ser. No. 370,372
Int. Cl.² F01B *13/04*
U.S. Cl. 92—143 **5 Claims**

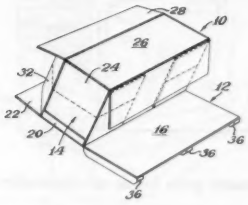


1. A hydraulic piston, the whole of which, when in use, operates within a cylinder subject to hydraulic pressure shock waves, comprising a piston body having a crown with an annular depression just within the rim of said crown, and a conical projection axially on said crown with its base disposed within said annular depression, said conical projection projecting substantially beyond the rim of said crown, and furthermore, wherein said conical projection includes a counter-bore therewithin, leading to a porous sintered plug contained within said conical projection.

3,905,282
PROCESS AND APPARATUS FOR ASSEMBLING A BULK CONTAINER

Larry W. Heavner, Glen Ellyn, and Kenneth L. Gidewall, Clarendon Hills, both of Ill., assignors to Coronet Container, Lombard, Ill.

Filed Jan. 28, 1974, Ser. No. 436,870
Int. Cl.² B31B *15/00*
U.S. Cl. 93—36 M **32 Claims**

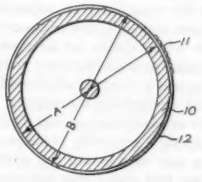


29. A process for assembling a container having first and second sections, said first section having a bottom and side flaps, and a plurality of rigid skids secured to the underside of said bottom, said process comprising the steps of aligning a plurality of said skids at a first station, transferring said skids to a second station, applying adhesive to the upper surface of said skids during movement thereof from said first station to said second station, stopping the movement of said skids at said second station, placing said first container section directly on top of said skids, applying one mechanical fastener only into each of said skids and through said first container section for mechanically securing each skid to said container section, and thereafter moving said skids and said container section simultaneously along a path of travel.

3,905,283
IMPROVED ROTARY CUTTING DIE

Kenneth Vincent Baker, Stillman Valley, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 467,926
Int. Cl.² B31B *1/14*
U.S. Cl. 93—58.2 R **3 Claims**



1. A rotary cutting die for converting sheet material into die cut products comprising,

a cylindrical die blank having a diameter less than a predetermined reference diameter,

a weld bead on the peripheral surface of said die blank in a predetermined configuration and serving to increase the effective diameter of said die blank to said predetermined reference diameter, and

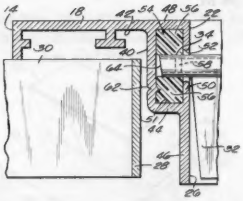
said weld bead having a cutting edge precisely coincident with said predetermined reference diameter.

3,905,284

ADJUSTABLE GRILLE

Floyd E. Busse, Verona, Wis., and Leon J. Theis, Sanford, N.C., assignors to Wehr Corporation, Milwaukee, Wis.

Filed June 13, 1974, Ser. No. 478,919
Int. Cl.[2] F24F *13/00*; E06B *7/08*
U.S. Cl. 98—110 **10 Claims**



1. An adjustable grille for an air distribution system comprising

a frame defining an air passage opening and including a pair of opposed frame segments;

a plurality of parallel spaced deflector blades disposed in said opening and extending transversely between said frame segments; and

means supporting said deflector blade from said frame segments for pivotal movement relative to said frame segments to control the direction of air flow through said opening, said support means including

means defining an elongated slot in each of said frame segments into said opening,

a pair of elongated support members made from a pliable material, each of said support members having a generally U-shaped cross section and including a pair of opposed, spaced leg portions connected together at one end by a thin web section having an outer face,

means on each of said frame segments for carrying respective one of said support members with said outer face of said web section located adjacent said slot, and

pivot pin means extending from the opposite ends of each of said deflector blades, said pivot pin means extending through respective of said slots, extending in an interference fit through said web section of respective of said support members and including an outer end portion frictionally engaged by said leg portions of respective of said support members, whereby said support members frictionally restrain pivotal movement of said deflector blades and retained said deflector blades in a desired angular position.

9. A method for assembling an adjustable grille for an air distribution system including first and second pairs of opposed frame segments which define an air passage opening and a plurality of parallel spaced deflector blades, each of which extends between and is pivotally supported by said first pair of framed segments, comprising the steps of

forming a pair of elongated support members from a pliable material having a generally U-shaped cross section and including a pair of opposed leg portions connected together at one end with a thin web section;

providing each of said first pair of frame segments with an inner flange adapted to define a portion of said opening and having an elongated, longitudinally extending slot and with an elongated channel for receiving one of said support members in a position adjacent said slot;

providing outwardly extending pivot pins on the opposite ends of each of said deflector blades;

installing one of said support members into each of said channels with said web section located adjacent said slot;

positioning said deflector blades in parallel placed relation;

positioning said first pair of frame segments in opposed relation adjacent the opposite ends of said deflector blades with said slots aligned with respective of said pivot pins;

moving said first pair of frame segments against said pivot pins with sufficient force for each of said pivot pins to pierce through said web section of respective of said web sections and thereby form its own pivot hole in said web section; and

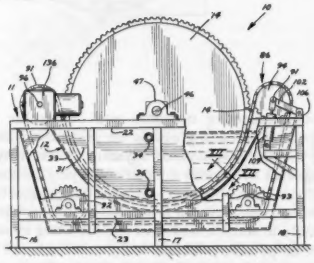
connecting said second pair of frame segments to said first pair of frame segments.

3,905,285

SNACK FRYER

Glenn M. Campbell, Minneapolis, and James G. Krassas, Anoka, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Apr. 27, 1973, Ser. No. 355,259
Int. Cl. A47j *37/12*
U.S. Cl. 99—353 **9 Claims**



1. Apparatus for frying shaped chip-type snack products comprising:

tank means including a zone for containing heated frying oil;

first mold means including rotatable drum means and first shaping means, said drum means being disposed partially within said oil containing zone and partially outside of said oil containing zone, said first shaping means being supported by said drum means for movement into, through and out of said oil containing zone, said first shaping means providing a first continuous shaping surface;

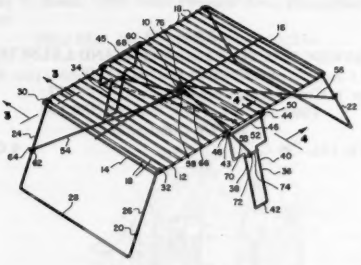
second mold means including conveying means and a second shaping means, said conveying means being disposed partially within said oil containing zone and partially outside of said oil containing zone, said second shaping means being supported by said conveying means for movement into, through and out of said oil containing zone, said second shaping means providing a second continuous shaping surface; and

spacing means for positively spacing said first shaping surface and said second shaping surface during passage through said tank means, said spacing means including means for fixedly maintaining at least a minimum spacing between said first and second shaping surfaces and said spacing means further including spring means for urging said first and second shaping surfaces toward said minimum spacing whereby said first shaping surface and said second shaping surface cooperate to provide a cavity for containing and shaping snack products as said products are carried through said oil containing zone.

3,905,286
BARBECUE GRILL

Carl F. Le Grady, 1024 N. 21st Ave., Phoenix, Ariz. 85009

Continuation-in-part of Ser. No. 231,969, March 6, 1972, abandoned. This application May 3, 1973, Ser. No. 357,074
Int. Cl.[2] A47J 37/07; F24B 3/00
U.S. Cl. 99—450 8 Claims



1. In a barbeque grill, the combination of: a generally rectangular wire frame having first and second pairs of spaced apart frame portions; a plurality of spaced apart grill bars generally parallel with each other and fixed to normally upper sides of said first pair of frame portions; said grill bars being generally parallel to said second frame portions; a pair of generally U-shaped support legs; each support leg having a pair of spaced apart normally upwardly extending members provided with upper ends having bearing loops; the bearing loops of each U-shaped leg surrounding and pivoted on one of said grill bars in adjacent relation to one of said second pair of frame portions, whereby said second pair of frame portions are disposed below said grill bars and serve as stop braces for said upwardly extending members of said legs when said pair of legs are disposed in downwardly diverging relation to each other and thereby supporting said frame and said grill bars; and U-shaped legs each having a normally horizontal bearing and support portion at its lower extremity; said bearing and support portion being integral with said upwardly extending members and being of a continuous piece of wire; a brace member is provided with opposite ends which are connected to each of said first frame portions; each brace member having a brace bar portion spaced outwardly from each respective first frame member; a pair of generally U-shaped auxiliary legs each having a pair of spaced apart normally upwardly extending members provided with normally upper ends having bearing loops, said bearing loops of each U-shaped auxiliary leg surrounding and pivoted on one of said first frame portions in adjacent relation to a respective one of said brace members; each of said brace members having its brace bar portion disposed below a respective one of said first frame portions whereby said auxiliary legs, when supporting said first frame portions, extend in downwardly diverging relation to each other and said upwardly extending members of each auxiliary leg bearing against a respective brace bar portion; each one of said auxiliary legs having a normally horizontal bearing and support portion at its lower extremity; said last mentioned bearing and support portion being integral with respective upwardly extending members of said auxiliary legs and being of a continuous piece of wire.

3,905,287
EGG AID

Humberto Vaca, 11874 College, Detroit, Mich. 48205

Filed Sept. 11, 1973, Ser. No. 396,226
Int. Cl. A47J 43/14
U.S. Cl. 99—571 3 Claims

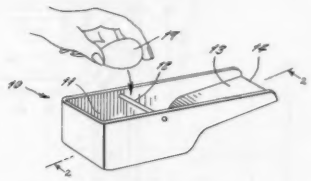
1. A kitchen utensil for cracking eggs and transferring eggs to a cooking vessel or the like which comprises,

a receptacle having a generally rectangular bottom adapted to be rested on a horizontal surface,

said receptacle having an end wall and side walls arising substantially vertically from said bottom, said side walls extending in substantially parallel planes and being substantially perpendicular to the plane of said end wall,

said bottom having one portion spaced from said end wall and which extends upwardly along a slope in a direction away from said end wall,

said bottom having another portion which adjoins said one portion and which extends upwardly and away from said end wall along a slope which is less than that of said one portion,



said side walls having portions which adjoin said bottom portions and extend upwardly therefrom,

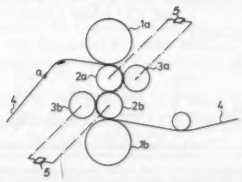
said bottom portions and side wall portions cooperating to define a chute having an open end for slidable delivery of eggs from said receptacle responsive to tilting said receptacle,

said bottom having a substantially uniform width through its extent from said end wall to said open end of said chute, and a bar fastened to said side walls above said bottom and between said end wall and said one portion of said bottom, said bar providing a surface upon which to crack an egg struck thereagainst.

3,905,288
PAPER-FINISHING CALENDERS

Pekka Holm, Voikkaa, Finland, assignor to Valmet Oy, Finland

Filed Dec. 18, 1973, Ser. No. 425,806
Claims priority, application Finland, Dec. 22, 1972, 3640/72
Int. Cl.[2] B30B 3/04
U.S. Cl. 100—162 R 7 Claims



1. In a paper-finishing calender, a stack of hard rolls including top and bottom rolls and a plurality of intermediate rolls situated therebetween for guiding a web through nips between said hard rolls while said web is lapped at least around said plurality of intermediate rolls, and at least one paper roll situated beside and cooperating only with one of said intermediate rolls for acting on a web lapped around the latter intermediate roll while the web travels from said one intermediate roll to the next hard roll for achieving the action of a supercalender with said one intermediate roll without lapping the web around said paper roll.

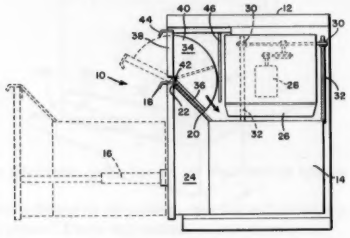
3,905,289
COMPACTOR WITH SEPARATE BIN FOR RECEIVING MATERIALS

Einar O. Engebretsen, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 391,995, Aug. 27, 1973, Pat. No. 3,841,214, which is a continuation-in-part of Ser. No. 188,295, Oct. 12, 1971, abandoned. This application Apr. 26, 1974, Ser. No. 464,546

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—215 **11 Claims**



1. In a compactor including a housing, a compaction receptacle received in said housing and movable between a compacting position disposed entirely within said housing and non-compacting positions displaced outwardly of said compacting position, and a compacting ram positioned above said receptacle when in said compacting position thereof, the improvement comprising:

a. a material receiving compartment positioned in said housing above said receptacle,

b. means providing access to said compartment independently of said receptacle,

c. a bottom wall of said compartment, and

d. means mounting said bottom wall for movement relative to said receptacle between a first position in which material is retained in said compartment and dumping positions in which material deposited in said compartment falls into said receptacle.

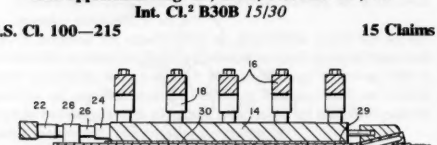
3,905,290
SELF-FEEDING PRESS FOR PRODUCING STRIP MATERIAL

Robert A. Caughey, Clinton Rd., Antrim, N.H. 03440

Continuation of Ser. No. 317,136, Dec. 21, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 499,935

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—215 **15 Claims**



1. A press for compacting and integrating material to form continuous flat sheets comprising spaced parallel arrays of long narrow bars, means supporting the arrays for relative movement toward each other and for supporting the bars in each array for reciprocal movement, means for supplying the material to the space between the arrays of bars at one end of the press, means for applying a predetermined constant uniform pressure perpendicular to the arrays of bars so as to apply a uniformly constant pressure transversely of the material introduced between the bars, means for advancing the bars individually in a predetermined sequence in sliding compressive engagement with the material in the direction opposite to the direction of movement of the material into the press, means for retracting all of the bars in consonance to withdraw the strip from the press and means for urging the bars in the arrays of bars toward each other through reciprocal movement of the bars.

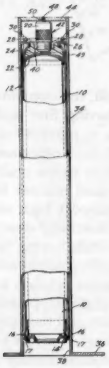
3,905,291
CARTRIDGE-ACTUATED DEVICE AND LAUNCHING ASSEMBLY USING SAME

George T. Corbin, Jr., Cinnaminson, N.J. 08077

Filed Apr. 11, 1973, Ser. No. 350,194

Int. Cl. C06d *5/00*

U.S. Cl. 102—39 **4 Claims**



1. In a cartridge-actuated device for releasing explosively-propelled gas through gas-releasing means located at one end thereof in response to electrical detonation of an explosive cartridge in said device to launch military stores from an aircraft, wherein said device comprises: a multipart container containing said cartridge and intended to maintain its structural integrity upon actuation of said cartridge; an electrical contact exposed to the exterior of said container within a depression at the opposite end of said container from said gas-releasing means, and responsive to an electric current supplied thereto to detonate said cartridge; said container comprising a first part extending integrally about said opposite end of said device adjacent said contact, and a second part threadedly secured to said first part and extending about said one end of said device and supporting said gas-releasing means; and means for securing said container to a mounting structure without substantial external breech support of said device against forces generated by actuation of said cartridge; the improvement according to which:

said means for securing said container to said mounting structure comprises mounting means on said first part of said container for securely mounting said first part to said mounting structure during a normal operation thereof, and during an abnormal operation thereof in which said cartridge is actuated when said gas-releasing means is not fully operative; a portion of said second part of said container is frangible to burst and relieve pressure in said container before other parts thereof burst during said abnormal operation; and the walls of said depression are of metal and said contact is recessed below the top of said depression by a distance at least about one-hald the average diameter of said depression; said device also comprising pressure-resistant gas-sealing means positioned to prevent gas under high pressure in said container adjacent said cartridge from flowing between the threads

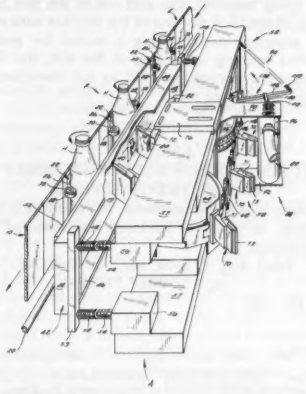
holding together said first and second parts of said container.

3,905,292

DECORATING MACHINE WITH TIMED INK DISPENSER

Anthony T. Rossi, 1800 Point Pleasant Ave., Bradenton, Fla. 33505

Filed Mar. 26, 1971, Ser. No. 128,246
Int. Cl. B41f *17/22*
U.S. Cl. 101—40 **16 Claims**



3. In a decorating machine for printing a decoration on the surface of an object at a decorating station, having means for moving said objects past said decorating station in a given direction with their decoration-receiving surfaces facing said decorating station, the improvement comprising a printing assembly at said decorating station comprising a plurality of print applying means for applying printing fluid to said decoration-receiving surfaces of said objects, a supply means adapted when actuated to supply printing fluid directly to said applying means, means to move said print applying means sequentially past said supply means and said decorating station in synchronism with the movement of said objects past said decorating station, each of said print applying means in sequence picking up printing fluid directly from said supply means and applying said printing fluid to the decoration-receiving surfaces of said object at said decorating station, and means to actuate said supply means each time one of said print applying means moves therepast, thereby to dispense a separate measured amount of printing fluid to each of said print applying means, said supply means comprising container means having an aperture, closure means effective in a first position relative to said container means to closs off said aperture to prevent the flow of printing fluid therethrough, and means operatively connected to said applying means moving means to move said closure means to a second position, relative to said container, in which said aperture is open to permit the flow of fluid therethrough.

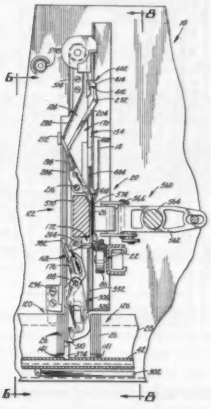
3,905,293

PLATE FEED MECHANISM

Gary G. See, Chagrin Falls, and Joseph G. Gardner, Painesville, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Jan. 26, 1973, Ser. No. 327,051
Int. Cl.² B41L *47/18*
U.S. Cl. 101—56 **39 Claims**

1. Apparatus for sequentially feeding printing plates from a plate holder to a printing station, said apparatus comprising plate guide means for guiding movement of the printing plates to the printing station, reciprocatable pickup means for engaging a lower edge portion of a first printing plate disposed in the plate holder at a pickup station, cyclically operable drive means for moving said pickup means through a lift stroke to move the first printing plate from the plate holder into engagement with said guide means, said drive means being operable to move said pickup means downwardly through a return stroke and into engagement with a lowermost edge portion of the second printing plate at the pickup station and to thereafter move said pickup means upwardly through a second lift



stroke to move the second printing plate from the plate holder to said guide means, said drive means including a drive member, motor means for moving said drive member, and elongated flexible connector means for operatively interconnecting said drive member and said pickup means, said connector means including variable length spring means and cable means connected to said pickup means, said motor means being operable to move said drive member and cable means to alternately increase and decrease the effective length of said spring means during lift and return strokes of said pickup means, and means for sequentially moving the printing plates along said guide means to the printing station.

3,905,294

HIGH SPEED LINE PRINTING APPARATUS

Gordon Brent Barrus, El Segundo; Leo Joseph Emenaker, Playa Del Rey, and Raymond Franklin Melissa, Inglewood, all of Calif., assignors to Pertec Corporation, El Segundo, Calif.

Division of Ser. No. 333,221, Feb. 16, 1973, Pat. No. 3,834,303. This application Jan. 23, 1974, Ser. No. 435,759
Int. Cl.² B41J *9/02*
U.S. Cl. 101—93.48 **4 Claims**

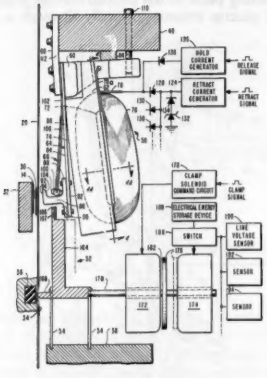
1. A hammer arrangement for use in a high speed printer comprising:

means for generating a magnetic flux during selected time periods;

hammer means positioned adjacent said flux generating means for magnetic coupling therewith, said hammer means including impact means and spring means, said spring means having an end fixed in relation to said magnetic flux generating means and a free end supporting said impact means, said impact means having a retracted position and a printing impact position, said impact means being biased by said spring means away from said retracted position and toward a rest position between said retracted and printing impact positions, generation of said magnetic flux retracting said impact means to said retracted position and storing energy in said spring

means, said spring means driving said impact means toward said impact position upon termination of said magnetic flux

means for sensing a power failure error condition which requires inhibition of the flight of said impact means to prevent said impact means from reaching said printing impact position, said sensing means producing a signal indicative of the pressure of said power failure;



means responsive to said sensing means signal for engaging said hammer means and inhibiting the flight of said impact means to prevent said impact means from reaching said printing impact position; and

means including energy storage means responsive to said sensing means signal and coupled to actuate said means for engaging said hammer means to inhibit flight of said impact means.

3,905,295

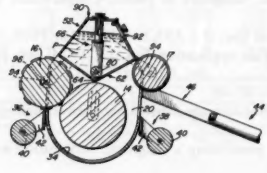
ROLLER PRINTER

John Bielesch, and Helene Bielesch, both of 3282 Tara Rd., Philadelphia, Pa. 19154

Filed Mar. 14, 1974, Ser. No. 451,279

Int. Cl.[2] B05C *17/02;* **B41F** *31/02*

U.S. Cl. 101—331 **12 Claims**



1. A roller printer, comprising, in combination:

a. a frame;

b. a carrying roller having a paint conveying surface and rotatably mounted on the frame;

c. a printing roller rotatably mounted on the frame and arranged for engaging the carrying roller; and

d. supply means for providing paint to the carrying roller, the supply means including:

i. a paint reservoir mounted on the frame and having a bottom portion provided with a slot disposed immediately adjacent the surface of the carrying roll; and

ii. shutter means arranged adjacent the slot for controlling passage of paint from the reservoir to the carrying roller, the shutter means including a U-shaped bracket having a pair of spaced legs connected together by a back portion adjustably attached to the reservoir, and a roll mounted on the legs and arranged adjacent the slot, the reservoir bottom portion being V-shaped with the slot being provided in the bottom of the V, and the roll being movable into and out of the slot by adjustment of the back portion of the bracket with respect to the reservoir and forming a means for providing a desired opening or closing of the slot, the slot being opened for permitting fluid to run therethrough and onto the carrying roller.

3,905,296

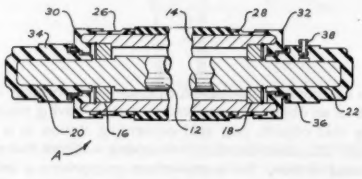
INK MIST SUPPRESSION ROLLER ASSEMBLY FOR A ROTARY PRINTING PRESS

Bohdan Washschynsky, Westchester, Ill., and Rex D. Stone, La Peer, Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 5, 1974, Ser. No. 494,530

Int. Cl.[2] B41F *31/26*

U.S. Cl. 101—348 **4 Claims**



1. An improved ink roller assembly for a rotary printing press ink mist suppression system comprising:

a stationary, elongated shaft,

a cylindrical, electrically conductive sleeve disposed coaxially about an intermediate portion of said shaft,

bearing means supporting said sleeve for independent rotation about the axis of said shaft,

a resilient covering wrapped about the outer surface of the sleeve and having electrical resistivity characteristics such that a high voltage potential applied to the sleeve will create an electric field outwardly circumjacent the covering,

circuit means for applying a high voltage potential through the roller assembly to the sleeve including current conductor connection means projecting outwardly from an end of the shaft at a point outwardly beyond the sleeve, and contacting means for maintaining a circuit from the connection means to the sleeve when said sleeve is rotating, and dielectric shroud means substantially encapsulating the entire roller assembly, except for the resilient covering, including shaft end-cap insulator elements which remain stationary with said shaft, and annular collar-like insulator elements disposed about the opposite ends of the sleeve and rotatable therewith,

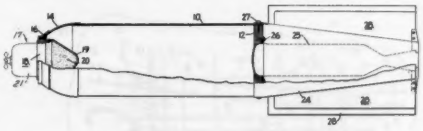
said end-cap insulator elements having stepped, annular, external surfaces formed at one end thereof to interfit with corresponding stepped annular, interval surfaces on said collar-like insulator elements, and said collar-like insulator elements having at least one axially projecting annular flange portion adapted to interfit with an annular recess provided in the end-cap insulator element adjacent thereto.

3,905,297

ROCKET PROPELLED INCENDIARY BOMB

Charles Barr, Buffalo, and George B. Urquhart, Lewiston, both of N.Y., assignors to Textron, Inc., Providence, R.I.

Filed Jan. 9, 1952, Ser. No. 265,592
Int. Cl.[2] F42B 13/14
U.S. Cl. 102—66 2 Claims



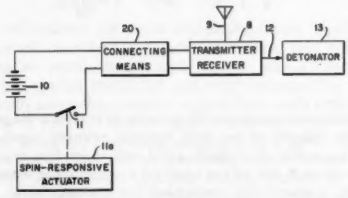
1. A rocket propelled incendiary bomb subjected upon firing to acceleration forces, comprising in combination, a main incendiary charge container of generally cylindrical form, an annular bracket fixed to the front end of said container, an ignitor assembled from externally thereof into said bracket and comprising a mounting ring slip-fitting into locked position relative to said bracket and carrying at its front end, a fuse and at its rear end a dispersion device, said dispersion device comprising a generally conically shaped shell carrying an explosive charge therein in communication with said fuse, frangible connection means interconnecting said ring and said shell and capable of withstanding said acceleration forces but rupturing under target impact forces whereby said shell is driven like a piston rearwardly through said main container incendiary charge upon explosion of said explosive charge to rupture the main container portion and drive the ignited incendiary contents thereof in all directions outwardly therefrom.

3,905,298

ELECTRONIC PROXIMITY FUSE INCORPORATING MEANS FOR PREVENTING PREMATURE DETONATION BY ELECTRONIC COUNTER MEASURES

Ekkehard Rehbock, Weissenhorn, Schwaben, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm (Danube), Germany

Filed Oct. 18, 1962, Ser. No. 232,660
Claims priority, application Germany, Oct. 21, 1961, 21001
Int. Cl.[2] F42C 13/04
U.S. Cl. 102—70.2 P 9 Claims



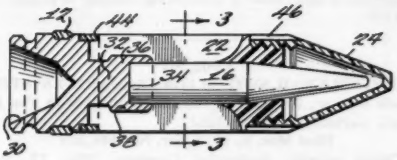
1. In a projectile, the combination which comprises:
a. an electronic proximity fuse circuit including
1. a detonator and
2. a Doppler-frequency responsive transmitter-receiver connected to said detonator for applying a trigger signal thereto when the projectile is near the target; and
b. means for applying electric power to said fuse circuit only when the projectile is near its target, in consequence of which the time interval during which an electronic counter measure device may act on said transmitter-receiver for purposes of prematurely detonating said detonator, is short.

3,905,299

DISCARDING SABOT PROJECTILES

Fritz K. Feldmann, Santa Barbara, Calif., assignor to Pacific Technica Corporation, Santa Barbara, Calif.

Continuation of Ser. No. 278,859, Aug. 8, 1972, Pat. No. 3,847,082, which is a continuation of Ser. No. 854,095, Aug. 29, 1969, Pat. No. 3,714,900. This application Oct. 23, 1973, Ser. No. 408,379The portion of the term of this patent subsequent to Feb. 6, 1990, has been disclaimed.
Int. Cl.[2] F42B 13/16
U.S. Cl. 102—93 3 Claims



1. A spin stabilized discarding sabot projectile adapted for firing from the muzzle of a gun comprising a sub-caliber core having a conical forward body portion and a generally cylindrical main body portion, a full-caliber sabot base having a forwardly extending member with a forwardly opening recess for receiving the core, a rotating band extending circumferentially around said base for imparting rotation to the projectile during traverse of a gun barrel, a sabot body covering the sub-caliber core, the sabot body having an internal recess for engaging the forwardly extending base member to mount the sabot body on the sabot base, said sabot body having a conical forward body portion, a plurality of grooves in said forward body portion, said sabot body having a rear body portion including a plurality of rear body segments threadedly secured to and extending rearwardly from the forward body portion in covering relationship to the core, said body segments being defined by slots extending longitudinally of the sabot body, a retaining ring for engaging the body segments adjacent the base for securing the body segments in fixed relation to each other, and for cooperating with the rear body portion to secure the core in axial alignment with said projectile, said retaining ring for fracturing on the application of centrifugal force to the projectile and for releasing the body segments of the sabot body to separate radially from the core initially at the rear portion of the sabot body and to further separate from the core progressively toward the forward body portion so that the rearwardly separated body segments are exposed to the force of propelling gases issuing from a gun barrel which gases impinge upon the body segments to discard the sabot body from the sub-caliber core, and so that the sabot base is exposed to aerodynamic drag forces for removal from the core.

3,905,300

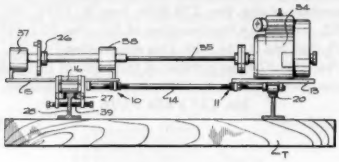
RAIL KNOCKER

John Kenneth Stewart, Columbia, S.C., assignor to Canron, Inc., Phillipsburg, N.J.

Filed Sept. 23, 1974, Ser. No. 508,168
Int. Cl.[2] B61B 12/00
U.S. Cl. 104—1 R 10 Claims

1. A self propelled rail vibrator comprising a chassis; non-driven means on the chassis for engaging each rail of the track; a vibrator means mounted on the chassis adjacent one rail; means on the chassis to drive said vibrator; said chassis including a leaf member extending longitudinally of said one rail and

carrying a pair of said non-driven means for engaging the track spaced longitudinally on said leaf member unequally on either side of said center of mass of the vibrator to engage said one rail.



3,905,301

TURNTABLE RAIL SWITCH FOR TRANSPORT SYSTEMS

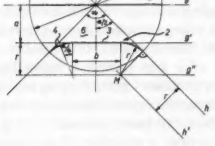
Erwin Meister, Delemont, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Mar. 8, 1974, Ser. No. 449,289

Claims priority, application Germany, Mar. 22, 1973, 2314400

Int. Cl.[2] E01B *3/00*

U.S. Cl. 104—99 **3 Claims**



1. Rotary turntable switch for transport systems having first rail ends terminating in diametrical alignment, and other rail ends terminating at angles with respect thereto, comprising a straight connecting section (1) and a curved connecting section (2), wherein the curved connecting section (2) is characterized by

two circular segments (4), each terminating at one end adjacent the edge of the circle of rotation of the turntable switch, curved in the same direction, and a straight connecting portion (3) parallel to the straight connecting section (1) connected between the other ends of the circular segments and connecting the circular segments (4).

3,905,302

SWITCH, ESPECIALLY FOR MAGNETICALLY AND PNEUMATICALLY FLOATING VEHICLES

Peter Fink, and Werner Gorlitz, both of Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

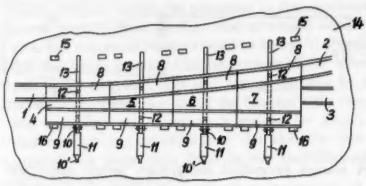
Filed Sept. 24, 1973, Ser. No. 400,321

Claims priority, application Germany, Sept. 28, 1972, 2247551

Int. Cl. E01b *25/06*

U.S. Cl. 104—130 **13 Claims**

1. A switch, especially for magnetically and pneumatically floating vehicles, which includes: horizontally displaceable switch means comprising a plurality of individual switch sections arranged one behind the other in the direction in which a vehicle is to be driven over said switch, said switch means including a plurality of track sections movable selectively to a position for forming a curved track to guide a vehicle through a curve and also movable selectively to a position to form a substantially straight track to guide a vehicle along a straight path, actuating means operatively connected to said track sections for selectively moving the same to the desired positions for forming a curved track and a straight track respectively, supporting means supporting said actuating means,



said supporting means including a base surface common to and adapted to support all of said switch sections, and auxiliary means associated with said supporting means and operatively connected to said switch sections for selectively lifting the same off and causing the same to be supported by said base surface in a contact-free manner.

3,905,303

SWITCH FOR A MAGNETIC SUSPENSION RAILROAD

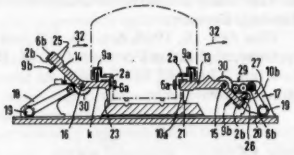
Hans-Jurgen Dull, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 16, 1973, Ser. No. 416,368

Claims priority, application Germany, Nov. 17, 1972, 2256608

Int. Cl.[2] E01B *23/06*

U.S. Cl. 104—130 **2 Claims**



1. An improved mechanically settable switch for a magnetic suspension railroad of the type wherein primary conductor loops on each side of a vehicle react with secondary reaction members on each side of the roadbed to generate at least one of support, guidance and propulsion forces comprising:

a. first and second double lever arms on opposite sides each containing first and second arms rotatable about an axis parallel to the direction of travel having mounted on the first arm secondary reaction members identical to those on the main portion of the railroad and arranged to provide straight ahead travel and on the second arm similar reaction members arranged to provide for curved travel, said double lever arm arranged so that it mates with the main section of the track; and

b. means for rotating said double lever arm between a first position wherein the reaction members on said first arms are aligned with the main track and a second position wherein the secondary reaction members on said second arms are aligned with said main track.

3,905,304

CHAIN FOR CONVEYOR SYSTEM

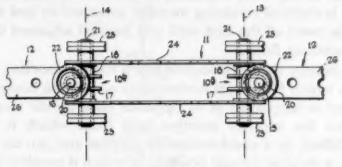
Walter Desmond Ord, Birmingham, England, assignor to Redman Fisher Engineering Limited, Tipton, England

Filed July 10, 1974, Ser. No. 487,002

Claims priority, application United Kingdom, July 20, 1973, 34833/73

Int. Cl.² B61B *13/00*

U.S. Cl. 104—172 C 4 Claims



1. In a chain of the kind comprising a plurality of links and a plurality of connecting bodies arranged alternately along the length of the chain, each body being connected to a pair of links for pivoting movement relative thereto about respective mutually-perpendicular axes and each link comprising a pair of link elements arranged side-by-side, the improvement wherein there is provided on the body means for engaging with at least one of the links connected thereto for preventing relative pivoting of the body and said one link through 180° from the relative positions occupied when the chain is straight and for preventing reversal of said body relative to said one link to change the pitch of the chain.

3,905,305

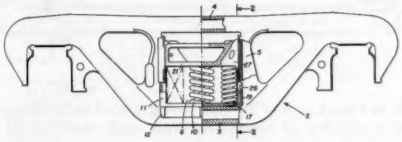
SNUBBED RAILWAY TRUCK BOLSTER

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 30, 1973, Ser. No. 383,863

Int. Cl.² B61F *5/06*, *5/12*, *5/50*; F16F *1/12*

U.S. Cl. 105—197 D 6 Claims



1. In a railway car truck comprising a pair of side frames supported on wheel and axle assemblies, said side frames having an upper compression member and a lower tension member spaced therefrom and interconnected by a pair of vertically extending columns spaced from each other longitudinally to define a bolster opening therebetween, a two part bolster assembly consisting essentially of a static bolster and a dampened active bolster, the static bolster being a beam of channel section with opposed flanges extending vertically upward between the pair of side frames to define a spring seat surface and having a pair of downwardly extending flanges at each end thereof spaced longitudinally of the bolster to form longitudinal cavities which envelop and contact the tension members of the side frames and holds them in square relationship with the bolster, said active bolster disposed above the static bolster and extending between side frames, the active and static bolsters each having a surplus of spring retaining means over and above those necessary to accommodate the maximum number of springs required to support the car in full lading condition, at spaced apart locations on the bolsters laterally between the centers and ends thereof, spring members disposed between the active and static bolsters in selected ones of the spring retaining means in predetermined positions which members are effectively adapted to reduce a car body natural roll frequency to stabilize the car body on the truck.

3,905,306

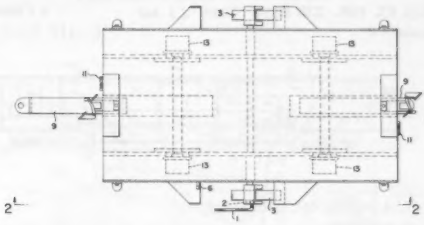
CONVERTIBLE RAIL-HIGHWAY MINE CAR

John R. Janes, Benton, Ill., assignor to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 21, 1974, Ser. No. 444,417

Int. Cl.² B61D *15/00*

U.S. Cl. 105—215 C 3 Claims



1. A convertible rail-highway mine car and the like having four rail-engaging wheels and two ground-engaging wheels, said ground-engaging wheels being manually movable from an up or storage position to a down or ground-engaging position by means of a pivoting axle and rotatable lever which are torsion-spring assisted in the movement to the up position, the movement of said pivoting axle being controlled by means of a toothed ratchet gear, a latch to engage said ratchet gear and a latch release lever.

3,905,307

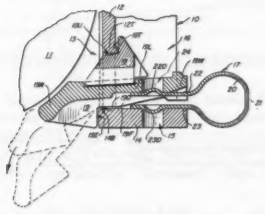
RESILIENTLY BIASED PEDESTAL KEY ASSEMBLY

Robert W. MacDonnell, Crete, and Otto A. Shander, Chicago Heights, both of Ill., assignors to R. W. Mac Company, Crete, Ill.

Filed Aug. 27, 1974, Ser. No. 500,850

Int. Cl. B61f *5/28*, *5/52*, *15/20*

U.S. Cl. 105—221 K 6 Claims



1. A side frame key assembly for preventing accidental escape of a roller bearing unit mounted for relative vertical movement in a pedestal-type side frame having a vertical side wall having a horizontal base portion projecting away from the roller bearing unit, said vertical side wall having a generally rectangular key opening facing a lower peripheral region of the roller bearing unit, the key opening bordered by a bottom corner portion and a top corner portion of the side wall, said key assembly comprising angular keying structure, freely movable in the key opening and having bottom keying means to fulcrum against said bottom corner portion and top keying means for abutment against said top corner portion, said bottom keying means having an inwardly projecting lever portion overlying said base portion and an outwardly projecting retainer portion bordering the lower peripheral region of the roller bearing unit, and locking spring means releasably reacting between said base portion and said bottom keying

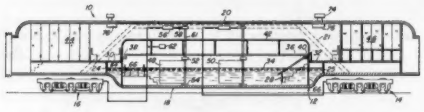
means to bias said bottom keying means and top keying means, respectively, into constant engagement with said bottom corner portion and top corner portion.

3,905,308

RAILWAY SWIMMING POOL CAR

Gaetano J. Laudato, Jr., 2 Lamartine Pl., Jamaica Plain, Mass. 02130

Filed June 7, 1973, Ser. No. 367,744
Int. Cl. B65j *1/22*
U.S. Cl. 105—238 R **4 Claims**



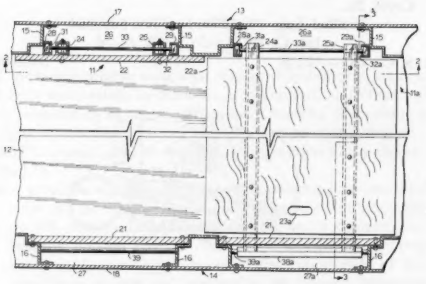
1. A railway car, comprising
a. a chassis,
b. a cabin mounted to said chassis,
c. said cabin being formed with an open-top tank along the bottom thereof adapted to contain a quantity of water therein, and,
d. at least one baffle movably mounted to said chassis from a position transverse thereof and actuating means connected to said baffle.

3,905,309

SECOND DECK SYSTEM

Leslie D. Suter, 1721 N. 50th St., Omaha, Nebr. 68104

Filed Sept. 12, 1974, Ser. No. 505,240
Int. Cl.² B61D *3/06*; **A47F** *5/08*; **B65J** *1/02*
U.S. Cl. 105—372 **4 Claims**



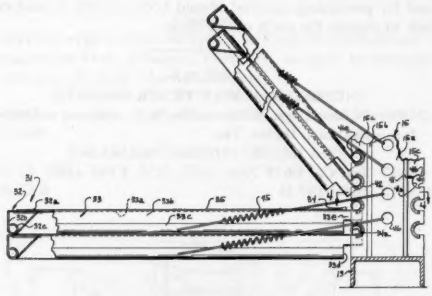
1. A self-storing, non-removable system for selectively providing a second deck intermediate the floor and roof of a freight compartment, the compartment having a pair of side walls which are spaced apart a distance not greater than the height of the compartment and each of which is provided with sheathing and longitudinally spaced, vertical posts which project inward from the sheathing, the system comprising a plurality of panel sections, each of which includes;
a. vertical guideways fixed to opposing faces of a pair of adjacent posts of the first wall, and a horizontal support member fixed to and extending between opposing faces of a corresponding pair of posts of the second wall;
b. a slide captive in and movable along each guideway;
c. a rectangular, rigid deck section having a width comparable to the longitudinal spacing of the posts and a length comparable to the transverse distance between the side walls;
d. means connecting the first end of the deck section to the slides for pivotal movement about a horizontal axis;
e. support means fixed to the second end of the deck section and adapted to engage the support member to support that end of the section and to prevent relative transverse movement between the section and the second side wall, the support means being adapted to be disengaged from the suppor. member by upward movement of the second end of the deck section;
f. stop means reacting between the posts of the first wall and the first end of the deck section for supporting that deck end at the same elevation as the second end; and
g. a horizontal retaining member attached to and spanning the posts of the first wall and located adjacent the compartment floor,
h. whereby the deck section has a load-supporting position in which it extends horizontally across the compartment and is supported at its opposite ends by the stop means and the support member and from which it may be shifted, by a combination of vertical and pivotal motion, to a vertical storage position in which it overlies the posts of the first wall and is held in place by coaction between the support means and the retaining member.

3,905,310

STOCK RACK WITH PIVOTED TRAYS

Clarence H. Hager, Rockford, Ill., assignor to Modern Caster Co., Inc., Rockford, Ill.

Filed Sept. 26, 1974, Ser. No. 509,451
Int. Cl.² A47F *5/00*, *7/04*
U.S. Cl. 108—111 **14 Claims**



1. In a stock rack of the type having spaced upright supports and a plurality of superposed trays each mounted on the spaced upright supports for swinging movement about a horizontal axis adjacent a rear edge of the tray from a lower position through an arc of less than 180° to a raised position; the improvement wherein each tray has a rolled rim of substantially circular cross-sectional configuration extending along said rear edge of the tray, said upright supports being located intermediate the ends of the rolled rim on the trays and each having means defining a plurality of semicylindrical bearing surfaces at vertically spaced locations therealong engaging the outer surface of the rolled rim on a respective one of the trays to swingably support the trays on the upright supports.

3,905,311

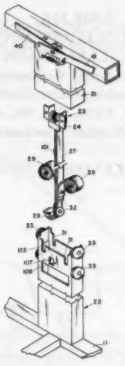
VERTICALLY ADJUSTABLE OVERBED TABLE

John H. Carpentier, Fort Atkinson, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed Apr. 26, 1974, Ser. No. 464,433
Int. Cl.² A47B *9/02*
U.S. Cl. 108—136 **4 Claims**

1. In an overbed table having a pedestal-like base, a top, a pair of telescoping columns interconnecting said base and top, means contained within said columns for counterbalancing telescopic movement thereof, and means contained within said columns for controlling telescopic movement thereof, the improvement comprising a rigid member positioned within

said columns, said member having said counterbalancing and controlling means integrally affixed thereto whereby the same



may be removed from said columns with said member as an integral unit for service and repair.

3,905,312

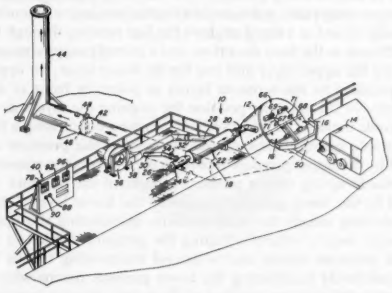
PROCESS AND APPARATUS FOR INCINERATING WASTE MATERIALS

Howard H. Nichols, 100 Bryn Mawr Ct., Apt. B-419, Pittsburgh, Pa. 15221

Filed May 8, 1974, Ser. No. 468,028

Int. Cl.[2] F23G *5/12;* **F23M** *7/00*

U.S. Cl. 110—8 R **11 Claims**



1. Apparatus for incinerating waste materials comprising,

a furnace having an internal incinerating chamber,

said furnace chamber includes an inlet opening in the upper end portion thereof for receiving preheated combustion air from a source and an outlet opening in the lower end portion thereof for discharging a gaseous effluent stream from said furnace chamber,

a plurality of charging doors sealing the upper end portion of said furnace chamber,

actuating means for opening and closing said charging doors to permit the charging of the waste materials into said furnace chamber at a preselected rate,

first control means for monitoring the oxygen content of the combustion air in said furnace chamber, and

second control means for regulating the flow of the preheated combustion air through said inlet opening to said furnace chamber in response to the oxygen requirements in said furnace chamber as monitored by said first control means to insure complete combustion of the waste materials in said furnace chamber,

means for recording the temperature in said furnace chamber, and

means for preheating the combustion air introduced into said furnace chamber to a preselected temperature.

3,905,313

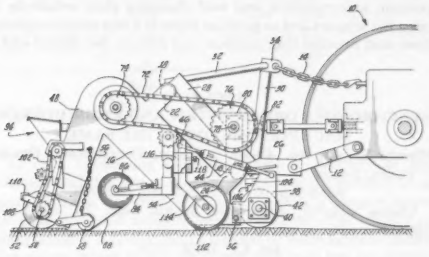
SEEDING MACHINE

Tobias H. A. Grether, Camarillo, Calif., assignor to Cal-Turf, Inc., Camarillo, Calif.

Filed Dec. 6, 1973, Ser. No. 422,329

Int. Cl.[2] A01C *7/08*

U.S. Cl. 111—1 **9 Claims**



1. A seeding machine comprising an ambulant main frame, a dirt skimming element on the lower forward portion of the frame, a dirt elevator carried by the frame and having a dirt inlet adjacent the dirt skimming element, said elevator having an elevated dirt discharge adapted to direct the elevated dirt to the ground rearwardly of the dirt inlet of the elevator, a supply of open mesh sheet material supported by the frame having means for feeding and laying the sheet on the ground rearwardly of the dirt skimming element, a seed supply device on said frame having a seed outlet directed toward the ground in the path of flow dirt from said elevator, and the frame including means extending downwardly from said elevator for guiding the discharged dirt and seed in a layer onto the open mesh sheet material.

3,905,314

THREAD CUTTING DEVICE IN EMBROIDERING MACHINES

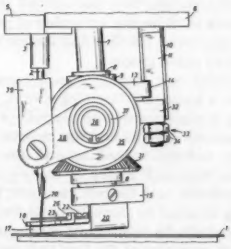
Kurt Bolldorf, Kaiserslautern, and Edgar Busch, Trippstadt, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Sept. 4, 1974, Ser. No. 502,950

Claims priority, application Germany, Sept. 5, 1973, 2344720

Int. Cl.[2] D05C *3/04*

U.S. Cl. 112—83 **12 Claims**



1. A device for use with embroidery machines for clamping and cutting needle thread held by an operating needle, com-

prising a scissors including a lower portion and an upper portion movable relatively thereto, each of said upper and lower portions having a cooperative cutting edge, a clamping plate resting on said upper plate and having an edge spaced from said lower portion cutting edge and overlapping said lower portion, the cutting edge of said upper portion being movable during closing between said clamping plate and said lower portion to clamp the thread therebetween, and means for moving said upper portion, said lower portion and said clamping plate relatively and together to close them around the thread at a location of the needle and to clamp the needle and cut it, and to move all of said upper portion, said lower portion and said clamping plate to an intermediate position with the clamped thread, and thereafter to move said upper portion, lower portion and said clamping plate relatively to open the scissors and to position them in a rest position spaced from said intermediate position and release the thread end.

3,905,315

SYNCHRONOUS DRIVE SYSTEM AND EMBROIDERING MACHINE EMPLOYING THE SAME

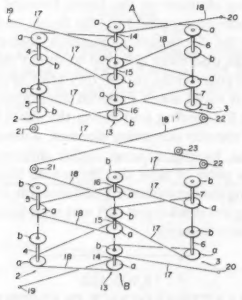
Hiroshi Sasaki, No. 48-14, 2-chome, Denenchohu, Ota-ku, Tokyo, Japan

Filed Sept. 6, 1974, Ser. No. 503,904

Claims priority, application Japan, Sept. 20, 1973, 48-106677

Int. Cl.² D05C *3/04*

U.S. Cl. 112—86 **5 Claims**



1. A synchronous drive system adapted for industrial use, and essentially constituted by first and second unit mechanisms, each comprising:

first and second stationary shafts arranged in spaced relation to each other, each having one or more pulleys arranged one above another and each provided with a plurality guide grooves;

a slider means mainly composed of a movable shaft arranged between said first and second stationary shafts, said movable shaft having a plurality of pulleys which are disposed one above another and are each provided with a plurality of guide grooves;

first and second belt members each having its one end secured to a stationary fastening means, said belt members being in engagement with the pulleys of said first and second stationary shafts and the pulleys of the movable shaft in a fashion trained around the guide grooves thereof, so that each pulley of the movable shaft is in engagement with both the belt members, the slider means thus being adapted to move towards the first or second stationary shafts by traction of the belts, said first and second belt members of the first unit mechanism having the free ends thereof integrally connected, respectively, to the free ends of the first and second belt members of the second unit mechanism, said drive system further including a rotary drive means which engages with either of the first and second belt members to draw the same.

3,905,316

SEWING MACHINE WITH EQUIPMENT FOR SEWING OF PARALLEL SEAMS

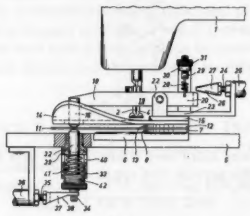
Gunther Mall, Kaiserslautern, Germany, assignor to Pfaff Industriemaschinen GmbH, Kaiserslautern, Germany

Filed May 9, 1974, Ser. No. 468,428

Claims priority, application Germany, May 21, 1973, 2325706

Int. Cl.² D05B *35/10*

U.S. Cl. 112—153 **7 Claims**



1. In a sewing machine for sewing edge parallel seams on upper and lower superposed layers of sewing goods of any contour, of the type having a stitching place comprising at least one needle and at least one material feeder, supporting plates for the two layers including a seaparating plate for maintaining the two layers in spaced relation positioned in front of the stitching position and including a plate covering the separating plate, guide means for the two layers extending laterally of and at a sharp angle to the line running through the needle axis in the feed direction, and a pair of pressure means, one for the upper layer and one for the lower layer, for applying pressure to the separate layers at points in front of and laterally of the stitching position for aligning the layers along the guide means, the improved construction comprising a first adjustable spring means adapted to control the pressure applied by the upper pressure means to the upper layer, a second adjustable spring means adapted to control the pressure applied by the lower pressure means to the lower layer, a first inactivating means for independently inactivating the upper pressure means without affecting the pressure applied to the lower pressure means and a second inactivating means for independently inactivating the lower pressure means without affecting the pressure applied to the upper pressure means.

3,905,317

CONTROL CIRCUIT FOR CONTROLLING THE FEED OF A CAP STERILIZER FEED SYSTEM

Joseph C. Pacilio, Park Ridge, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 231,321, March 2, 1972, Pat. No. 3,833,339. This application Aug. 29, 1974, Ser. No. 501,650

Int. Cl.² B65B *57/06;* **G07C** *9/00*

U.S. Cl. 113—114 R **5 Claims**

1. A control circuit for controlling the feed of a cap sterilizer feed system comprising:

a first means for sensing the passage of a cap past a point in the cap feed system,

an up-down counter having first and second input terminals and first and second output terminals.

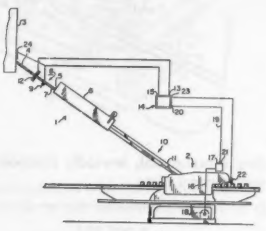
electrically conductive means connecting the output of said first sensing means to said first input terminal,

cap stop means for halting the passage of caps toward a sterilizer,

a second means for sensing the passage of caps from a processing machine,

electrically conductive means for connecting the output of said sensing means to the second input of said up-down counter,

a time delay switch having a control terminal, an input terminal and an output terminal,



electrically conductive means for connecting the control terminal of the time delay switch to the first output terminal of the up-down counter,

electrically conductive means for connecting the output terminal of the time delay switch to the motor of the processing machine, and

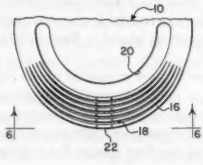
electrically conductive means for connecting the cap stop means to the second output terminal of the up-down counter.

3,905,318

INTEGRAL MULTIFINGER CONTACT AND METHOD OF MAKING

Stephen Verner Andersen, Burbank, Calif., and Edwin Grant Swick, Bartlett, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 447,616
Int. Cl.² B21D *53/36*
U.S. Cl. 113—119 **5 Claims**



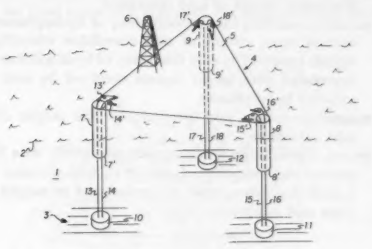
1. A method of producing unitary multifinger electrical brush contact members having slight clearance between adjacent slender fingers, comprising the steps of shearing and elongating a plurality of adjacent portions along a nonlinear shear line with substantial portions of the shear line being disposed on one side of an imaginary straight line interconnecting the extremities of the sheared portions, the shearing and elongating being performed on a sheet of conductive material in a direction transverse the plane of the sheet, each next adjacent portion, in a given direction laterally of the sheet, being elongated beyond its respective elastic limit to a greater amount than the previous portion, returning each adjacent elongated portion to a coplanar position generally in the plane of the sheet wherein the adjacent portions are spaced slightly from each other over a substantial extent of their length, the method further including the step of deforming downwardly a limited length of each slender portion to form laterally aligned small radius contact points intermediate the extremities of the sheared portions, wherein a plurality of densely arranged, independently flexing, contact fingers are formed unitary with a base portion.

3,905,319

TENSION-LEG PLATFORM

Frank J. Schuh, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 28, 1974, Ser. No. 446,945
Int. Cl.² B63B *35/44*
U.S. Cl. 114—.5 D **7 Claims**



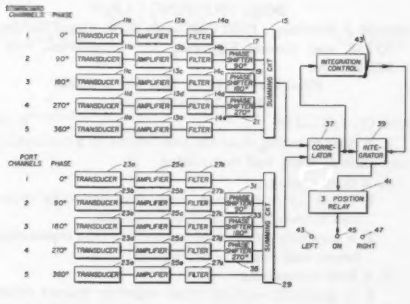
1. In a tension-leg platform having a plurality of legs wherein each leg has a plurality of lines which connect to an anchor means, the improvement comprising a support means for each line, said support means being movably carried on said platform, a power means carried by each support means, said power means being associated with each line for retracting and paying out said line, individual hydraulic means mounted between said support means and said platform, said individual hydraulic means being independently movable so that each power means is essentially vertically movable relative to said platform, said essentially vertical movement of said power means being at least partially controlled by said individual hydraulic means, and for each leg the individual hydraulic means are interconnected with one another, whereby said movement of one power means on a given leg is automatically balanced with the other power means on that same leg thereby maintaining all lines on that leg under substantially the same tension load.

3,905,320

LOW FREQUENCY HOMING SYSTEM

William J. Mueller, Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 30, 1964, Ser. No. 380,118
Int. Cl.² F42B *19/06*
U.S. Cl. 114—23 **6 Claims**



3. In a homing system for torpedoes, an elevator control system comprising,

a first array of hydrophones axially aligned along the upper side of a torpedo,

a second array of hydrophones axially aligned along the lower side of said torpedo,

a correlator having a first input circuit, a second input circuit, and an output circuit,

an integrator having a variable time constant dependent upon the distance between the torpedo and a target, said integrator having an input circuit and an output circuit, means connecting said first array of hydrophones to the first input circuit of said correlator,

means connecting said second array of hydrophones to the second input circuit of said correlator whereby target signals received by said first array of hydrophones may be correlated with target signals received by said second array of hydrophones,

means connecting said integrator to the output circuit of said correlator,

means connecting said integrator selectively to a first or a second elevator control circuit of said elevator control system depending upon the polarity of an output voltage from said integrator.

3,905,321

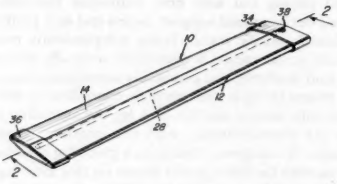
SAIL BATTEN

Joseph A. Blythe, Jr., 804 Euclid Ave., Jackson, Miss. 39202

Filed Mar. 22, 1974, Ser. No. 453,985

Int. Cl.² B63H 9/04

U.S. Cl. 114—103 **13 Claims**



1. A sail batten including a flattened tubular body of stiff, shape retentive and somewhat flexible and resilient material, the interior width of said body being several times the interior height of said body and an elongated stiffening structure of a thickness greater than the internal height of said body telescoped into and extending substantially the full length of said body and positioned mid-way between and spaced from the opposite side portions of said body with said stiffening structure spreading the central portions of the greater width sides of said tubular body apart.

3,905,322

BOAT MOORING CLEAT

Donald J. Peterman, 1800 Columbus Blvd., Coral Gables, Fla. 33134, and Ramon Figueroa, 333 Miamarina, Sup 314, Miami, Fla.

Filed May 6, 1974, Ser. No. 467,284

Int. Cl.² B63B 21/04

U.S. Cl. 114—218 **6 Claims**

1. A boat mooring cleat for attachment to a concrete structure such as a sea wall comprising,

A. a horn having,

1. a pair of projections, extending generally outwardly and upwardly in opposed directions,

2. a generally horizontal central portion connecting between said pair;

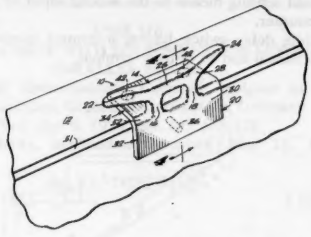
B. a base comprising,

1. a generally vertical plate member spaced from said horn and having an outer face generally vertically coplanar with the outer face of said horn,

2. a generally horizontal plate member integral with and extending inwardly from the top of said vertical plate member, generally at right angles thereto;

C. integral connection means between said horn and base;

D. means to connect said base to the concrete structure



including a horizontal, inwardly extending pin, integral with said vertical plate.

3,905,323

AMPHIBIOUS VEHICLE

Joseph A. Kacere, St. Clairsville, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest.

Filed Oct. 29, 1974, Ser. No. 518,281

Int. Cl.² B63H 1/38

U.S. Cl. 115—1 R **5 Claims**

1. An amphibious vehicle, comprising

a frame having two sections pivotally affixed to each other for rotation about a substantially vertical pivotal axis;

a first hollow sphere rotatably mounted in one section of the frame for rotation about a first substantially horizontal axis;

a second hollow sphere mounted in the other section of the frame on a second substantially horizontal axis;

a third hollow sphere rotatably mounted around the second sphere for rotation about the second horizontal axis;

power means in the first sphere for rotating the first sphere about the first axis; and

control means in the second sphere coupled to the power means of the first sphere for controlling the power means and pivotal movement of the second and third spheres relative to the first sphere for steering the vehicle.

3,905,324

FLAREHOLDER

Hugh James English, Apt. 8, W. 27 Central Ave., Spokane, Wash. 99208

Filed Jan. 3, 1972, Ser. No. 214,693

Int. Cl. E01f 9/10

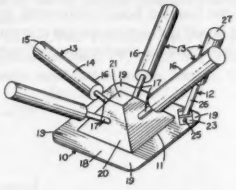
U.S. Cl. 116—63 P **2 Claims**

1. A flareholder for holding a thermally luminescent flare having an elongate cylindrical body supporting a substantially axially alinged nail in its base, comprising, in combination:

a base member having a planar peripheral area structurally communicating with;

a medial, upwardly projecting supporting body having at least one hole normally aligned to releasably receive the nail of a nail-base type flare and support the flare substantially normally to the upwardly projecting supporting

body; said supporting body comprising a truncated pyramid having a flare nail hole normally aligned in the medial part of each pyramid face; and



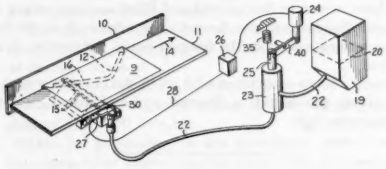
handle means associated with the base providing a pivotably mounted handle to aid manual manipulation thereof.

3,905,325

ENVELOPE FLAP MOISTENING APPARATUS

Walter T. Labore, Stamford, and Richard A. Hallenbeck, Wilton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 10, 1974, Ser. No. 513,526
Int. Cl.² B05C *11/105*
U.S. Cl. 118—7 **5 Claims**



1. An envelope flap moistening apparatus, comprising:
means defining an envelope flap feed path;
a moistening blade extending into the envelope flap feed path and having a discharge slot for dispensing moistening fluid to a gummed portion of a contiguously passing envelope flap;
a reservoir operatively connected to said blade and containing moistening fluid for said moistening blade, a level of said moistening fluid in said reservoir generally disposed below a level of the discharge slot in the moistening blade;
priming means operatively connected between said reservoir and said moistening blade for supplying a quantity of moistening fluid to said moistening blade, when said moistening blade runs dry;
sensing means supported by said moistening blade for sensing when the moistening blade runs dry; and
control means operatively connected between said sensing means and said priming means for causing said priming means to supply the moistening blade with fluid in response to the sensing of dryness in said moistening blade by said sensing means.

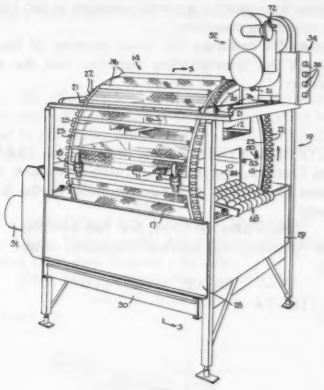
3,905,326

PRODUCT SPREADING MACHINE AND METHOD

Bernard Eisenberg, Rockaway, N.J., assignor to Solbern Corporation, Fairfield, N.J.

Filed Dec. 4, 1973, Ser. No. 421,692
Int. Cl.² B05C *5/00;* **B05B** *3/00*
U.S. Cl. 118—24 **17 Claims**

1. A machine for spreading a uniform layer of particulate materials on the top surfaces of flat items comprising:
a conveyor for transporting the food items along a linear path;
a material distribution member having a surface bounded on one side by an edge extending over the conveyor in a direction diagonal to the linear path for a lateral distance at least equal to the maximum width of items on the conveyor;
means for delivering portions of the materials to be spread on the food items to a region of the surface of the distribution member spaced laterally from the diagonal edge, the portions of materials being delivered by said means substantially uniformly along a line parallel to the linear path; and



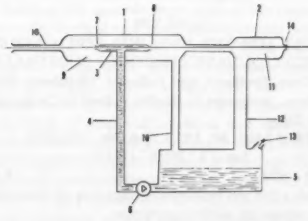
means for advancing the delivered materials substantially uniformly across the surface of the distribution member in a direction transverse to the linear path and toward the diagonal edge to cascade over said edge in a uniform curtain of flow spanning at least the maximum width of the items to be covered.

3,905,327

APPARATUS FOR THE IMPREGNATION WITH A TREATING LIQUID AND FOR THE SQUEEZING OF A TEXTILE PRODUCT RUNNING CONTINUOUSLY

Rene A. Daniel, St-Quentin, France, assignor to OPI-Textile, Neuville-St-Amand, France

Filed Jan. 11, 1974, Ser. No. 432,695
Claims priority, application France, Jan. 15, 1973, 73.01215
Int. Cl.² C23C *13/08*
U.S. Cl. 118—50 **13 Claims**



1. Apparatus for continuous treatment of an elongated textile product by thorough impregnation with a viscous treating liquid and thereafter by controlled squeezing thereof, which apparatus comprises:

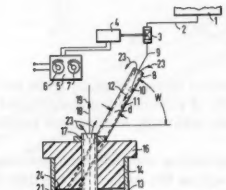
— an impregnation chamber with at least an inlet orifice and an outlet orifice, which are open for continuous passage of textile product therethrough,
— A squeezing chamber having at least a gas actuated squeezing nozzle means forming an outlet orifice,
— a tank containing the treating liquid,
— means for feeding said treating liquid, under high pressure, from the tank to the impregnation chamber,
— means for recycling the treating liquid from the squeezing chamber into the tank,
— means for ensuring a partial vacuum in the tank and in the squeezing chamber,
— means for ensuring the axial running of the product through the impregnation chamber and the squeezing chamber.

3,905,328

METERING SYSTEM FOR METERING FLUXES

Hermann Trattner, and Hans Raab, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 8, 1974, Ser. No. 449,396
Claims priority, application Germany, Mar. 9, 1973, 2311818
Int. Cl.² B05C *11/00*
U.S. Cl. 118—74 **5 Claims**



1. A wire tinning system comprising a molten tinning bath, a tube having an open end immersed in said bath and providing a protective chamber above the level of said bath, means for drawing a wire from said bath and through said protective chamber, a reservoir containing flux and having a discharge portion, an adjustable metering valve connected to said discharge portion of said reservoir, and a flux delivery tube disposed obliquely with respect to the surface of said molten tinning bath, the flux delivery tube receiving flux from said metering valve and delivering it into said protective chamber.

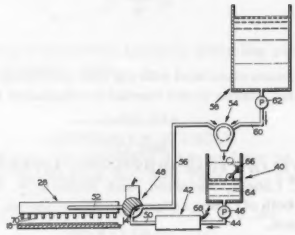
3,905,329

APPARATUS FOR THE UNIFORM APPLICATION OF FOAMED LIQUID MIXTURES TO SUBSTRATES

Charles N. Cone, Portland, and Julius M. Steinberg, Hillsboro, both of Oreg., assignors to Pacific Adhesive Company, Inc., Hillsboro, Oreg.

Filed Mar. 30, 1973, Ser. No. 346,630
Int. Cl.² B05C *11/10*
U.S. Cl. 118—602 **6 Claims**

1. Apparatus for the uniform application of foamed liquid mixtures to substrates which comprise:
a. a reservoir for holding a quantity of foamable liquid,
b. liquid foaming means,
c. first conduit means interconnecting the reservoir and the liquid foaming means,
d. foam spreading means downstream from the liquid foaming means,
e. second conduit means interconnecting the liquid foaming means and the foam spreading means,
f. foamed liquid defoaming means downstream from the foam spreading means,
g. third conduit means interconnecting the liquid foaming means and the foamed liquid defoaming means,
h. the foamed liquid defoaming means communicating with the reservoir means for discharging defoamed liquid into the same,



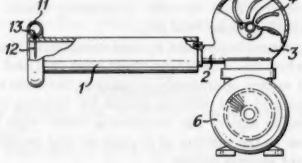
i. valve means in the second and third conduit means and operable to direct the flow of foam selectively to the foam spreading means or the foamed liquid defoaming means, and
j. pump means associated with all of the conduit means for driving the liquid in foamed and unfoamed condition therethrough.

3,905,330

ELECTROSTATIC DEPOSITION OF PARTICLES

Ronald Alan Coffee, E1 2 Mount Davis Rd., Hong Kong, Hong Kong

Filed Aug. 1, 1974, Ser. No. 493,964
Claims priority, application United Kingdom, Nov. 21, 1973, 53939/73; Nov. 21, 1973, 53940/73; May 16, 1974, 21764/74
Int. Cl. B05c *5/02*
U.S. Cl. 118—629 **16 Claims**

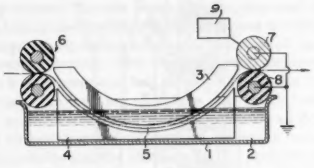


1. A device for electrostatically depositing particles onto a surface at earth potential, such device comprising a casing, means for introducing particles to be deposited into the interior of the casing, a discharge barrel extending from the casing and triboelectricity inducing means movable within the casing which also propel particles from the casing through and out of the barrel.

3,905,331
MEANS FOR PRECLUDING TRAILING OF TONER IMAGES IN ELECTROPHOTOGRAPHY OF THE WET TYPE

Tsuguo Kimura, Zushi; Setsuo Soga, and Toshio Watanabe, both of Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 194,340, Nov. 1, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,151
Claims priority, application Japan, Nov. 5, 1970, 45-109928
Int. Cl.² G03G *13/00*
U.S. Cl. 118—637 **7 Claims**



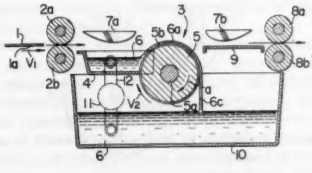
1. In an electrophotographic apparatus of the wet type with a developing device having:
   a. a developing tank containing developing liquid through which an exposed photosensitive sheet is passed;
   b. a metallic roller disposed at the exit of the developing tank for contacting the image bearing surface of the passing photosensitive sheet; and
   c. a squeegee roller disposed opposite the metallic roller for cooperatively contacting the passing photosensitive sheet at its back surface;

wherein the improvement comprises:
   d. means for rotating said rollers at a developing rate of greater than 150 mm./sec.;
   e. means for producing on the peripheral surface of the squeegee roller contacting the back of the photosensitive sheet, a surface resistance of less than 1×10^7 ohm-cm; and
   f. means for maintaining said squeegee roller at the same potential as said metallic roller to preclude the trailing of toner images.

3,905,332
ELECTROPHOTOGRAPHIC DEVELOPING APPARATUS USING DEVELOPING ROLLER

Hideo Sawada, Sagamihara; Van Hirafuji, Yokohama, and Kenya Komada, Atsugi, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1973, Ser. No. 410,988
Claims priority, application Japan, Nov. 13, 1972, 47-113648
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **4 Claims**



1. A developing apparatus for use at the developing station in wet-type electrophotographic copying machines comprising:
   a. a tank for holding and supplying a developing solution; and
   b. a developing roller means, disposed at the developing station and adjacent said tank with the peripheral surface thereof forming at least a part of a wall of said tank, for receiving developing solution from said tank on its peripheral surface and transferring it to the surface of a sheet fed thereby, said roller means rotating at a peripheral speed greater than the speed at which a sheet to be developed is fed thereby, and said peripheral surface of said roller means being formed with a series of threads having a lead angle α in accordance with the relationship:

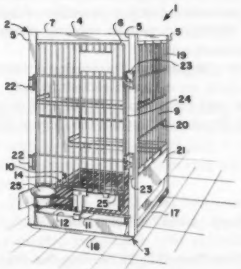
$$\frac{b}{L(V_2/V_1-1)}$$

where L is the effective length of the developing station, b is the thread pitch, V_1 is the speed at which a sheet to be developed is fed by said roller means, and V_2 is the peripheral speed of said roller means.

3,905,333
CAGE FOR LABORATORY ANIMALS

Charles L. Uhrig, Harrisonville, Mo., assignor to Schroer Manufacturing Company, Kansas City, Mo.

Filed May 13, 1974, Ser. No. 469,239
Int. Cl.² A01K *1/02*
U.S. Cl. 119—17 **4 Claims**

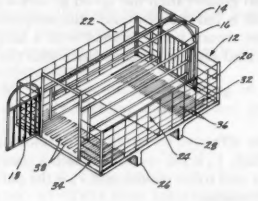


1. A urine deflector for supporting a cage floor having spaced openings in a cage for laboratory animals and having cage rear and side walls and a front door cooperating with a cage frame to define an enclosure for at least one animal and having an open top waste collecting receptacle removably positioned in a lower portion thereof, said urine deflector comprising:
   a. floor portions extending from respective cage side and rear walls, said floor portions being inclined downwardly from the respective cage walls and toward the interior of the cage sufficiently to permit liquid animal waste to flow toward a cage floor, said floor portion being inclined at such a minimum angle as to cooperate with a cage floor in forming the useable floor area of the cage;
   b. generally vertical wall portions depending from said floor portions, said vertical wall portions being spaced from the respective cage walls, said wall portions each defining a shoulder engageable by a cage floor; and
   c. a ledge portion extending toward the interior of the cage from each of said wall portions and spaced below said floor portion, said ledge portions being adapted to support a respective edge portion of the cage floor thereon, said ledge portions being inclined downwardly from said vertical wall portions and toward the interior of the cage to permit liquid animal waste to flow therefrom into said waste receptacle;
   d. said ledge portions terminating in depending flanges over an open top waste receptacle for flow of liquid animal waste from the floor portions, floor and ledge portions into said receptacle.

3,905,334
CONCRETE PIG PALLET

Donald W. Stevenson, Rt. No. 1, Mitchellville, Iowa 50169

Filed Apr. 12, 1974, Ser. No. 461,022
Int. Cl.² A01K *1/02*
U.S. Cl. 119—20 5 Claims



5. A pig pallet for use on a supporting surface, comprising, a concrete floor portion,

at least a pair of concrete supporting legs extending downwardly from said floor portion for supporting said floor portion above the supporting surface,

said floor portion comprising a central portion and first and second end portions positioned outwardly thereof,

said end portions having a plurality of spaced apart slots formed therein to permit the pig waste to pass downwardly therethrough,

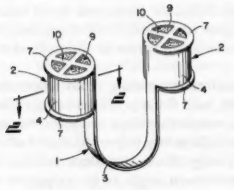
said second end portion comprising a central portion and side portions on opposite sides thereof,

the slots in said central portion of said second end portion having a greater width than the slots in said side portions.

3,905,335
NASAL AIR FILTER

Gerald J. Kapp, 14147 Euclid Ave., East Cleveland, Ohio 44112

Filed Mar. 21, 1974, Ser. No. 453,206
Int. Cl.² A62B *23/06*
U.S. Cl. 128—140 N 7 Claims

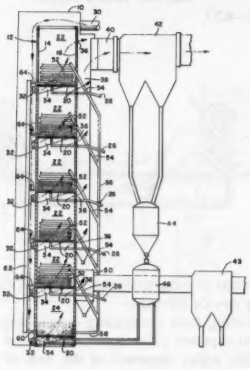


1. A nasal air filter comprising a pair of cylinders each having radially projecting yieldable flange means at least at one end thereof for yielding engagement with the nostril walls, said flange means being relatively thin in cross section and extending around the entire periphery of said cylinders in eccentric relation to the longitudinal axes of said cylinders wherein sections of the periphery of said flanges nearest each other are coincident with the periphery of said cylinders, said flange means having end portions where said flange means terminate which are gradually tapered to avoid any protrusions or sharp edges which might cause irritation to the nostrils, a filter material contained within said cylinders, and an interconnecting piece extending between one end of each cylinder to facilitate insertion and removal of the filter from the nostrils.

3,905,336
APPARATUS AND METHOD FOR GENERATING HEAT

Robert L. Gamble, Wayne, and Richard William Bryers, Cranford, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed Sept. 28, 1973, Ser. No. 401,923
Int. Cl.² F22B *1/02*
U.S. Cl. 122—4 D 3 Claims

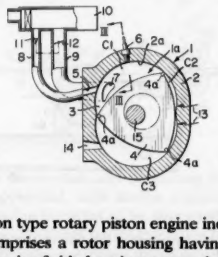


1. An apparatus for generating heat, comprising a housing, means for establishing a series of vertically aligned fluidized beds of particulate material in said housing, said material including a sulfur containing fuel and a sorbent for said sulfur, said fuel being combusted and said sorbent being sulfated in said beds, means for establishing an additional fluidized bed of particulate fuel material in said housing in vertical alignment with said series of fluidized beds, means for receiving the combustion gases from said series of beds and separating the gases from any of said particulate material entrained therein, first conduit means for passing said separated particulate material to said additional fluidized bed, second conduit means connecting each of said series of fluidized beds to said additional bed for passing the sulfated sorbent from said series of beds to said additional bed, said sulfated sorbent being desulfated in said additional bed to form a sulfur enriched gas, and means for passing said gas from said housing.

3,905,337
FUEL INJECTION TYPE ROTARY PISTON ENGINE

Masaharu Shimoji, and Haruhiko Satou, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed July 15, 1974, Ser. No. 488,488
Claims priority, application Japan, July 16, 1973, 48-86854
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.09 3 Claims



1. Fuel injection type rotary piston engine including a rotor casing which comprises a rotor housing having a trochoidal inner wall and a pair of side housings secured to the opposite sides of the rotor housing to define a rotor chamber therein,

a substantially polygonal rotor disposed in said rotor chamber for revolution and rotation therein with apices thereof in sliding contact with said trochoidal inner wall of the rotor housing so as to define working chambers between the casing and the rotor, exhaust means communicating with one of said working chamber at a time for removing fluid therefrom, first air intake port means formed in at least one of said side housings so as to open into the rotor chamber, first air intake passage means communicating with said first air intake port means and having first throttle valve means disposed therein, second air intake port means formed in said rotor housing so as to open into the rotor chamber, second air intake passage means communicating with said second air intake port means and having second throttle valve means disposed therein, means for closing said first throttle valve means in said first air intake passage means during light load operation of the engine while the second throttle valve of said second air intake passage means is still open, and fuel injection means for injecting fuel into one of the working chambers into which fresh air is introduced so that the injected fuel intersects the air flow from the second air port means, said second air intake port means having substantially smaller distance in the peripheral direction of the rotor housing than in the widthwise direction, the ratio of the effective passage area of the second air intake port means to that of the first air intake port means being between 1 to 3 and 1 to 9, whereby the air flow stream from the second air port means has a greater width than the injected fuel flow at the point of intersection.

3,905,338

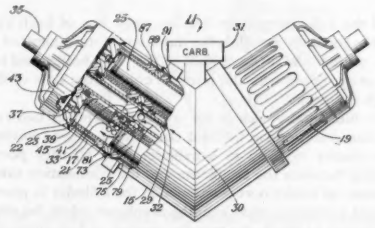
VEE ENGINE WITH CENTRIFUGALLY ASSISTED SCAVENGING

William F. Turner, Graham, Tex., assignor to Turner Research, Inc., Graham, Tex.

Continuation-in-part of Ser. No. 469,216, May 13, 1974. This application June 24, 1974, Ser. No. 482,154

Int. Cl. F02b *57/06*

U.S. Cl. 123—43 A **20 Claims**



1. In a rotary internal combustion engine of the so-called angle piston type having:

a. first and second cylinder blocks rotatable about respective central longitudinal axes; said first and second cylinder blocks each having a pluralty of radially spaced, substantially parallel cylinders arranged for rotation about respective said central longitudinal axes; the open ends of the respective sets of cylinders being disposed toward each other, aligned, and disposed at an angle with respect to each other so as to form a vee angle α of at least 90° and less than 180°;

b. first and second sets of pistons disposed in respective said cylinders, a pair of aligned pistons in aligned said cylinders being connected together at said vee angle α; each said respective pair of connected pistons being rotatable with and, by angular displacement, reciprocally movable within and with respect to respective cylinders as said pistons are rotated in a generally elliptical path; said pair of connected pistons maintaining their same relative position of top-on-top as they rotate with their respective cylinders;

c. first and second cylinder heads connected, respectively, with said first and second cylinder blocks and rotatable therewith;

d. a plurality of respective inlet ports for intake of a combustible mixture comprising a combustion supporting gas and fuel within respective cylinders atop respective said pistons therewithin at least by the time said pistons and cylinders have attained a predetermined first position; said intake ports being connected with and communicating with said cylinders at said first position;

e. ignition means for igniting said combustible mixture at a predetermined second position; said ignition means being operatively in communication with the interior of said cylinders intermediate a second end of said cylinders and respective said pistons at said second position for firing;

f. a plurality of respective discharge ports for discharging combustion products and waste gases, following firing and combustion of said combustible mixture, from within said cylinder and at a predetermined third position of respective said pistons and cylinders; said discharge ports being connected with and communicating with said cylinders at said third position; and

g. power delivery means connected with said first and second cylinder blocks for delivery of power with respect thereto;

the improvement comprising a centrifugally assisted intake and scavenging system that includes:

h. at least one mixture passageway traversing longitudinally of at least a portion of respective said cylinder blocks and connected with an intake manifold and a carburetor for passing said combustible mixture to respective said cylinders and inlet ports;

i. a plurality of respective inlet passageways connected with said mixture passageway and extending from said mixture passageway toward respective said cylinders; said inlet passageways having their respective terminal ends connected to respective inlet ports; said inlet ports being located in respective said cylinders and said terminal ends being disposed such that said dense charges of combustible mixture operatively coming into respective cylinders in said rotating cylinder blocks are thrown by the centrifugal and pressure differential forces to the radial exterior and to the top of said cylinder and forces combustion products and waste gases to the radial interior and bottom of said cylinder to and out respective discharge ports and passageways; and

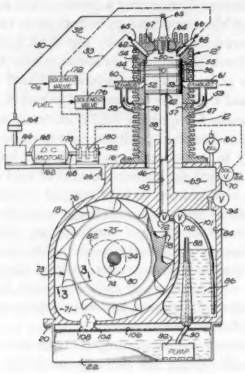
j. a plurality of respective discharge passageways connected with said discharge ports and extending exteriorly of said engine for discharge of said combustion products and waste gases; said discharge ports being disposed in respective said cylinders radially interiorly of a central longitudinal axis of each of said cylinders and toward said second end of said cylinder a distance above said inlet port that is equivalent to a degree of rotation and equivalent movement of respective said pistons and with respect to said cylinders within the range of 10°–20°; said radially interiorly being defined as toward respective central longitudinal axes of said cylinder blocks;

such that in each cylinder a respective discharge port is opened and its combustion products and waste gases are vented exteriorly of said internal combustion engine; subsequently, said inlet port is opened and the cool, dense charge of combustible mixture is flung into said cylinder, outwardly and upwardly toward said cylinder head to force hot, less dense combustion products and waste gases downwardly toward said piston and interiorly toward said discharge ports whereby effective scavenging is effected without overscavenging and wasting fresh combustible mixture.

3,905,339
PISTON ENGINE EMPLOYING HYDRAULIC MOTION CONVERSION

Marvin E. Wallis, 3755 San Remo Dr., Santa Barbara, Calif. 93105

Filed Oct. 23, 1973, Ser. No. 408,368
Int. Cl.[2] F02B 71/00; F02D 39/10
U.S. Cl. 123—46 R 25 Claims



1. A piston engine, comprising:
a piston and cylinder therefor and means for combusting fuel in said piston cylinder to effect rearward movement of said piston;
an hydraulic cylinder, a plunger therefor and means for delivering hydraulic fluid thereto, said plunger being connected to said piston whereby to expel hydraulic fluid from said hydraulic cylinder upon said rearward piston movement;
a rotor and housing therefor and means for supporting said rotor in said housing in the path of said expelled fluid, said rotor being formed to rotate in said housing upon impingement thereagainst of said expelled fluid, said housing defining a hollow chamber region which is free from hydraulic fluid in the vicinity of the point of expulsion of said hydraulic fluid from said hydraulic cylinder; means for returning said piston; and
means for exhausting products of said combustion.

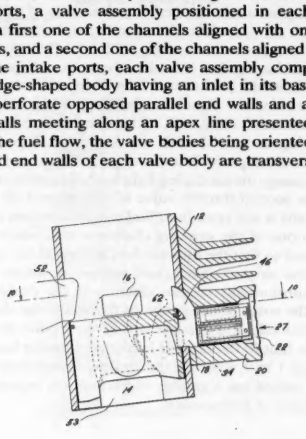
3,905,340
ENGINE VALVING AND PORTING

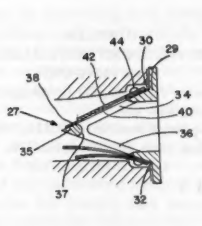
Eyvind Boyesen, Huntington Valley, Pa., assignor to Performance Industries, Inc., Huntingdon Valley, Pa.

Continuation-in-part of Ser. Nos. 282,734, Aug. 22, 1972, abandoned, and Ser. No. 361,407, May 8, 1973, abandoned.
This application June 29, 1973, Ser. No. 375,065
Int. Cl. F02b 33/04; F16k 15/16
U.S. Cl. 123—73 A 10 Claims

2. A reed valve assembly for controlling the flow of fuel to the intake port of a variable speed, crankcase compression engine comprising a valve body having two converging surfaces, the surfaces being joined by a transverse apex member, an opening in each of the surfaces, a primary reed overlying the opening on each of the surfaces, a vent formed in each of the primary reeds, each vent being positioned in a portion of the primary reed which overlays the opening over which the reed is positioned, the area of each of the vents being less than the area of each of the openings, secondary reeds overlying each of the vents, the secondary reeds having smaller area and being more yieldable than the primary reeds.

6. A fuel intake system for a variable speed two-cycle crankcase compression internal combustion engine having a piston working in a cylinder, a crankcase, transfer passages extending between the crankcase and the combustion side of the piston terminating in transfer ports in the cylinder spaced from each other circumferentially of the cylinder, a pair of intake channels in fluid communication with two intake ports in the cylinder, the intake ports arranged intermediate the transfer ports, a valve assembly positioned in each of the channels, a first one of the channels aligned with one of the intake ports, and a second one of the channels aligned with the other of the intake ports, each valve assembly comprising a hollow wedge-shaped body having an inlet in its base end, a pair of imperforate opposed parallel end walls and a pair of inclined walls meeting along an apex line presented downstream of the fuel flow, the valve bodies being oriented so that the opposed end walls of each valve body are transverse to the





axis of the cylinder and so that the apex line of each valve assembly generally parallels the direction of movement of the piston, ports in the inclined walls of the valve bodies and reed petals cooperating with the ports to control the flow of fluid through the ports.

8. A fuel intake system for a variable speed, two-cycle crankcase compression internal combustion engine having a skirted piston working in a cylinder with transfer porting extending between the crankcase and the combustion side of the piston, an intake port positioned in the cylinder to provide for direct communication with the crankcase when the piston is positioned to block the transfer porting, a fuel intake passage for receiving fuel from a supply source and delivering the fuel to the intake port, and a reed valve assembly for controlling the flow of fuel through the intake passage, the reed valve assembly including a hollow wedge-shaped valve body in the fuel intake passage and having an inlet in its base end, a pair of opposed imperforate end walls and a pair of inclined walls arranged in inclined planes meeting along an apex line, the valve body being oriented so that the apex line generally parallels the axis of the cylinder, the axis of the fuel intake passage from the intake port to the region of the valve body being extended generally radially of the cylinder and providing delivery of the fuel from the valve body through the intake port in substantially straight-line flow, the piston skirt having unvalved passage means of such vertical dimension and so positioned with respect to said intake port, as to provide fluid communication between the intake port and the crankcase whenever the piston is positioned to block the intake port, including the piston position in the region of bottom dead

center, whereby to ensure fluid communication between the intake port and crankcase throughout the engine cycle.

10. A fuel supply system for a variable speed internal combustion engine having fuel intake porting subject to pressure fluctuations with variation in engine speed, comprising a valve housing defining an intake passage adapted to deliver fuel to the intake porting of such an engine, an inclined wall in said passage extended in a plane obliquely angled to the axis of the passage and having a valve port therein, and an assembly of reed valve petals for said valve port positioned at the downstream side of said inclined wall and comprising a primary petal and a superimposed secondary petal connected at adjacent ends thereof with the inclined wall toward the upstream end thereof and having their other ends free to flex away from the inclined wall, the primary reed petal being extended over said valve port and having a vent in registry with the underlying port and spaced from the free end of the primary reed petal, the secondary reed petal extending over said vent but being shorter and more yieldable than the primary reed petal, the secondary reed petal being sufficiently flexible to open under pressure conditions incident to operation of the engine at any speed and the primary reed petal being sufficiently flexible to open under pressure conditions incident to operation of the engine at a high range of speeds but being sufficiently rigid to remain closed under pressure conditions incident to engine operation at a low range of speeds.

3,905,341

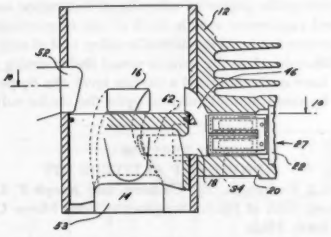
ENGINE VALVE MEANS AND PORTING

Eyvind Boyesen, Huntingdon Valley, Pa., assignor to Performance Industries, Inc., Huntingdon Valley, Pa.

Division of Ser. No. 375,065, June 29, 1973, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 361,407, May 8, 1973, abandoned. This application Nov. 15, 1973, Ser. No. 416,215

Int. Cl. F02b *33/04*

U.S. Cl. 123—73 R **9 Claims**



1. A variable speed, two-cycle, crankcase compression internal combustion engine comprising a cylinder, a piston movable in the cylinder, a crankcase, an intake port in the cylinder communicating with the crankcase, an intake tract in fluid communication with the intake port, a transfer passage for conducting fluid from the crankcase to the combustion side of the piston through a transfer port in the cylinder, an exhaust port in the cylinder, the piston acting as a valve means to cover and uncover the intake port, the exhaust port, and the transfer port, a reed valve assembly mounted in the inlet tract, the reed valve assembly comprising a valve body, a port in the valve body, a primary reed for controlling the flow of fluid through the port, means securing the primary reed to the valve body, a vent formed in the primary reed, a secondary reed disposed on the valve body for controlling the flow of fluid through the vent, and port means responsive to the flow of fluid through the transfer passage for supplying fluid from the intake tract at a point downstream from the valve assembly to the transfer passage.

3,905,342

IGNITION TIMING CONTROL SYSTEM

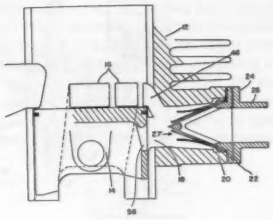
Nobuyuki Kobayashi; Masahiko Nakada, and Masanori Hanaoka, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichiken, Japan

Filed Jan. 3, 1974, Ser. No. 430,402

Claims priority, application Japan, Jan. 10, 1973, 5139

Int. Cl.² F02P *5/10*

U.S. Cl. 123—117A **5 Claims**



1. An ignition timing control system comprising, in combination an automotive vehicle internal combustion engine having an intake system including a carburetor for mixing fuel with intake air to produce a combustible mixture, and ignition plugs to ignite said combustible mixture, an ignition distributor for supplying high voltage current to said ignition plugs of said engine in accordance with a predetermined sequence, a vacuum advance device responsive to engine intake vacuum produced in said intake system downstream of said carburetor for advancing the ignition timing of said ignition distributor, and valve means connected in communication with said engine intake system both upstream and downstream of said carburetor and with said vacuum advance device, said valve means being arranged to control a vacuum to be introduced into said vacuum advance device in accordance with the operating modes of said engine in terms of an absolute level of said intake vacuum such that the vacuum at the absolute level is introduced into said vacuum advance device during acceleration of said vehicle to effect a vacuum advance in said ignition distributor and such that the vacuum at such an absolute level is at least partially reduced and introduced into said vacuum advance device during cruising operation of said vehicle and during deceleration thereof to effect a desired reduction in the vacuum advance.

3,905,343

STRATIFIED CHARGE SYSTEM

John J. Ryan, 18 Ellwood St., Glen Cove, N.Y. 11542

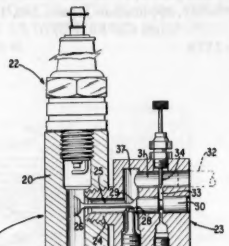
Filed Sept. 21, 1973, Ser. No. 399,302

Int. Cl.² F02B *19/10*

U.S. Cl. 123—75 B **2 Claims**

1. A device for reducing exhaust emission of internal combustion engines having cylinder means comprising a tubular ignition chamber having a first passage therein adapted to be mounted in a spark plug hole of a cylinder means of an internal combustion engine, said first passage being communicable with the interior of a cylinder means, a spark plug mounted on the outer end of said tubular chamber and in communication with said first passage, and fuel and air metering means mounted on said tubular chamber to communicate with said first passage, said means having a flow passage therein adapted for connection to a source of air and with said first passage, a freely slidable non-spring actuated poppet check valve in said flow passage for controlling flow of air to said first passage, said poppet valve being openable only by suction in said cylinder and closable only by compression in said cylinder, said poppt valve having a valve head cooperable with a valve seat connected to said first passage, a slidable valve stem having two ends, a shank smaller in cross-sectional area

than said valve stem joined to one end of said stem with the other end of said shank joined to said valve head, the effective area of the ends of said stem being so related that only pressure exerted on the stem during the compression stroke will



cause the valve to close the mixing passage to the cylinder and only the vacuum on the stem during the suction stroke will cause the valve to open to admit the air to pass to said first passage, the poppet valve being actuated and timed only by the pressure and vacuum pulsations of the engine cylinder.

3,905,344

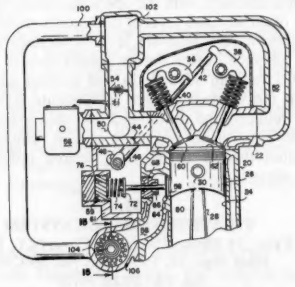
INTERNAL COMBUSTION ENGINE

Tony R. Villella, 3106 Hewitt Ave., Everett, Wash. 98201

Continuation-in-part of Ser. No. 353,341, April 23, 1973. This application Jan. 11, 1974, Ser. No. 432,662

Int. Cl. F02m *25/06;* **F02b** *75/02;* **F02d** *39/02*

U.S. Cl. 123—75 C **8 Claims**



1. In a four-cycle internal combustion engine, the combination of: a cylinder having a head end and a crankcase end; a piston reciprocally mounted in said cylinder; a fuel inlet valve communicating with said head end of said cylinder; said cylinder having an exhaust outlet opening in the sidewall thereof; said exhaust outlet opening communicating with atmosphere and being spaced from said head end of said cylinder a distance equal to a major portion of the stroke of said piston in said cylinder; an exhaust outlet valve disposed in communication with said head end of said cylinder; a recycling conduit means communicating between and with said exhaust outlet valve and said fuel inlet valve; an exhaust manifold through which said outlet opening communicates with atmosphere; and a second exhaust conduit communicating with said first recycling conduit; said second exhaust conduit also communicating with the interior of said exhaust manifold; and valve means adapted to divide flow from said first recycling conduit into said fuel inlet valve and said exhaust conduit.

3,905,345

CHOKE ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

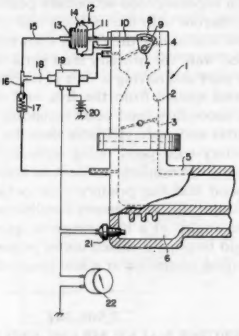
Masahiko Nakada, and Hirofumi Matsumoto, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1973, Ser. No. 426,125

Claims priority, application Japan, Feb. 12, 1973, 48-16486

Int. Cl.² F02M *1/14, 7/12*

U.S. Cl. 123—119 F **4 Claims**



1. A choke assembly for internal combustion engines having an intake manifold comprising a choke valve, a diaphragm box with a switch lever, a diaphragm within said diaphragm box dividing said diaphragm box into two chambers and connected to said switch lever of said choke valve, a vacuum conduit connecting one of the chambers in said diaphragm box with the intake manifold, a check valve and throttle mechanism provided in said vacuum conduit, a by-pass pipe connected to said vacuum conduit between said one of the chambers and said check valve and throttle mechanism and establishing a conduit to atmosphere, a solenoid valve with an exciting coil provided in said by-pass pipe, a temperature responsive switch for detecting the degree of warm-up of the engine and a vehicle speed responsive switch, both of the responsive switches being connected in series to said exciting coil of said solenoid valve, wherein when the vehicle speed and warming up of the engine have each exceeded a certain level, the by-pass pipe is closed by said solenoid valve to open the choke valve.

3,905,346

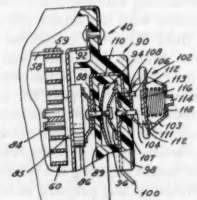
CHOKE CAP ALTITUDE KIT

Richard J. Freismuth, Mt. Clemens, and Joseph F. Lopiccola, Warren, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 20, 1974, Ser. No. 453,132

Int. Cl.² F02D *11/08*

U.S. Cl. 123—119 F **11 Claims**



1. An automatic choke system for use with a carburetor having an air/fuel induction passage and

an unbalance mounted, air movable choke valve mounted for variable movement across the passage to control airflow through the passage,

thermostatic spring means operably connected to the choke valve urging the choke valve towards a closed position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level,

an intermittently operable heater device located adjacent the spring means operable to transfer its heat output to the spring means when operable to reduce the choke valve closing force of the spring means and permit opening of the choke valve by airflow through the passage against it,

engine vacuum responsive means operable below a predetermined temperature to selectively render the heater device operable and inoperable in response to changes in engine vacuum,

a source of electrical energy, circuit means connecting the source to the heater device, temperature sensitive switch means in the circuit means operable to break and make the circuit as a function of temperature changes from a predetermined level,

and means mounting the vacuum responsive means to at times electrically connect the source to the heater device in another circuit that is parallel to the first-mentioned circuit connecting the source and heater device through the temperature sensitive means to thereby permit connection of the source to the heater device when the temperature sensitive means is operable to break the first-mentioned circuit bypassing the temperature sensitive means.

3,905,347

ELECTRONIC IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

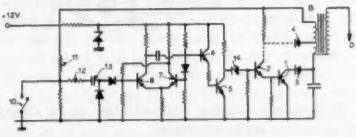
Andre Gabriel Lapeyronnie, Paris, France, assignor to FIME, France

Filed Oct. 16, 1972, Ser. No. 298,025

Claims priority, application France, Oct. 14, 1971, 71.36966

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **22 Claims**



1. An electronic ignition system for an internal combustion engine having a plurality of spark plugs, comprising sensing means for providing a train of control pulses having a recurrent rate proportional to actual engine speed; low-voltage electronic analog processing circuit means receiving said control pulse train and including shaping circuit means for shaping said control pulses into a sequence of square pulses having a predetermined width, and timing circuit means for controlling ignition spark delay by controlling the recurrent rate of said sequence of square pulses in accordance with the difference between the actual engine speed and a predetermined engine speed, power circuit means coupled to the output of said processing circuit means and responsive to said sequence of square pulses for providing high-voltage spark plug control pulses adapted to ignite said spark plugs; and distributing circuit means coupled to the output of said processing circuit means and responsive to the actual engine speed for distributing said high voltage spark plug control pulses to said spark plugs, and wherein said timing circuit comprises at least one operational amplifying means having first and second input terminals and an output terminal, a feed-back loop coupling the second input terminal to the output terminal of the operational amplifying means and comprising a resistance element and a capacitance element in series combination, an integrating means providing a d.c. voltage which varies as in inverse function of the recurrent rate of said sequence of shaped pulses derived from said sensing means, the first input terminal of said operational amplifying means being coupled through an amplitude adjusting circuit to said sensing means, the second input terminal being coupled through said integrating means to the sensing means, and a threshold trigger circuit having an input connected to the output terminal of said operational amplifying means and responsive to each shaped pulse provided by the sensing means for generating an ignition spark delay control pulse which is delayed from said shaped pulse by a time interval which is inversely related to the delay of the engine speed.

3,905,348

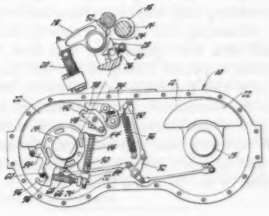
SHOCK PROOF ENGINE OVERSPEED CONTROL

Hugh A. Williams, Jr., Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed June 12, 1974, Ser. No. 478,461

Int. Cl.² F02D *31/00, 1/00*

U.S. Cl. 123—198 D **3 Claims**



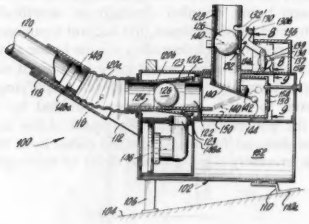
1. In combination with an internal combustion engine including rotating shaft means, an engine overspeed control mechanism comprising, in combination: engine shutdown means effective to halt engine operation when tripped; first and second flyweights on the shaft means biased radially inward but adapted to move radially outward with increasing engine speed, the first flyweight only being adapted to trip the engine shutdown means when the engine reaches a limit speed; a first link having one end attached to the first flyweight for outward movement therewith; a second link having one end connected to the second flyweight for outward movement therewith, the second link having a first portion engaging the first link at normal engine speeds such that first flyweight movement sufficient to trip the engine shutdown means is prevented, the second link further having a second portion brought into engagement with the first link just before the engine limit speed is reached, the second portion allowing first link and flyweight movement sufficient to trip the engine shutdown means, the first and second flyweights being circumferentially separated so that the outward movements of each have no substantial components in a common direction, whereby a unidirectional shock cannot move both flyweights simultaneously outward.

3,905,349

INDUCED AIR DEVICE FOR DISCHARGING SPHERICAL MEMBERS

John Nielsen, 88 Martha St., Freeport, N.Y. 11520, and Joseph H. Church, P.O. Box 202, North Situate, R.I. 02857

Filed Dec. 7, 1972, Ser. No. 312,874
Int. Cl.[2] F41F 1/04; B65G 51/28, 53/14
U.S. Cl. 124—11 R 2 Claims



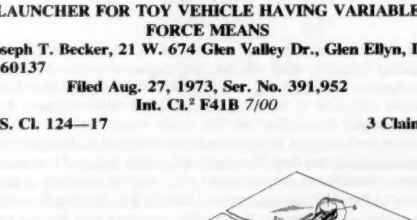
1. A ball throwing device comprising a cylindrical drum, support means for supporting each end of said drum on a base, said drum having its axis substantially horizontal and including a front end face with a ball throwing tube support bracket mounted thereon, a ball throwing tube pivotally supported on said bracket, said ball throwing tube having an intermediate flexible portion and an inner portion extending into said drum, a ball receiving tube in said drum extending into the inner end of said interior portion of said ball throwing tube, a fan in said drum providing an inducing air flow in the space between said receiving tube and the interior end of said ball throwing tube, a ball feed conduit extending into said drum from the top thereof, a trap door pivotally mounted adjacent the inner end of said ball feeding tube and being biased to a closed position, means for permitting one ball at a time to feed downwardly through said tube and against said trap door, said trap door being oriented to permit rolling of the ball from the delivery tube into said ball receiving tube whereby the inducing air flow causes the movement of the ball through said ball throwing tube, and detent means in said ball throwing tube for temporarily arresting said ball until the pressure therebehind builds up and for then hurling the ball outwardly from the discharge end of the throwing tube.

3,905,350

LAUNCHER FOR TOY VEHICLE HAVING VARIABLE FORCE MEANS

Joseph T. Becker, 21 W. 674 Glen Valley Dr., Glen Ellyn, Ill. 60137

Filed Aug. 27, 1973, Ser. No. 391,952
Int. Cl.[2] F41B 7/00
U.S. Cl. 124—17 3 Claims



1. A toy vehicle launcher comprising:

a launcher base having a slot with a front end, a retaining means proximate to said front end of said slot, and anchor means spaced from said front end of said slot;

a sliding block slidably engaged within said slot;

an elastic member elastic for its entire length, said elastic member having one end secured to said sliding block and extending generally parallel to said slot, over said retaining means and terminating in another end secured to said anchor means, wherein said anchor means permits said other end of said elastic member to be secured at a plurality of points located at varying distances from said front end of said slot, and wherein said elastic member is free to move longitudinally with respect to said retaining means and is in tension for all locations of said sliding block within said slot; and

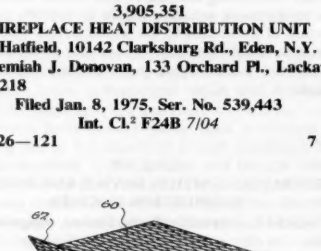
trigger means releasably engaging said sliding block at a point spaced from said front end of said slot wherein said trigger means includes a bell crank pivoted to said launcher base for limited rotation in the plane of said launcher base, said bell crank having a first arm releasably engaging said sliding block and a second arm extending beyond the periphery of said launcher base and wherein said trigger means further includes a spring member for biasing said first arm into engagement with said sliding block.

3,905,351

FIREPLACE HEAT DISTRIBUTION UNIT

James M. Hatfield, 10142 Clarksburg Rd., Eden, N.Y. 14057, and Jeremiah J. Donovan, 133 Orchard Pl., Lackawanna, N.Y. 14218

Filed Jan. 8, 1975, Ser. No. 539,443
Int. Cl.[2] F24B 7/04
U.S. Cl. 126—121 7 Claims



1. A fireplace heating unit adapted to be disposed in a fireplace recess and comprising:

a horizontally elongated air distribution manifold;

a blower unit for supplying air to said manifold;

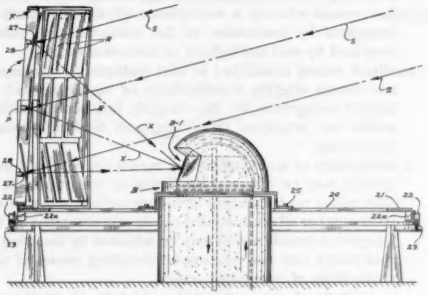
a plurality of generally U-shaped heat transfer conduits, said conduits being essentially parallel and extending generally rearwardly of said manifold in a right angular relationship relative thereto, said conduits having lower leg portions, upper leg portions and connecting portions, said lower and upper leg portions of each conduit being essentially horizontal and arranged in an essentially parallel, vertically spaced relationship with their rearwardly disposed ends fixed in air flow communication by their associated connecting portion, each of said lower leg portions having a forwardly disposed end defining an air inlet opening fixed in air flow communication with said manifold, each of said upper leg portions having a forwardly disposed end defining an air outlet opening arranged to overlie said manifold for directing air forwardly thereof; and

a grate supported by said upper leg portions.

3,905,352
SYSTEM FOR COLLECTING AND TRANSFERRING USABLE SOLAR HEAT

Arnold Jahn, 1124 N. Elm St., Fairmont, Minn. 56031

Filed Aug. 31, 1973, Ser. No. 393,561
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 11 Claims



1. In a system for collecting and transferring solar heat energy which employs a reflector unit-supporting device moved in orbital travel through a curvilinear path:

a multi-reflector unit comprising a multiplicity of individual reflector elements predeterminately arranged in a group area,

an upstanding mounting frame wherein said multiplicity of reflector elements are supported for variable angular tilting functions during cyclical operation of said system, means for mounting said frame on said unit-supporting device with freedom for tilting oscillation on a horizontal axis disposed centrally of said reflector group area,

reversible driving means controlled by a sun sensor for tilting said frame in synchronism with elevational variance of the sun in a daily cycle,

a solar ray absorbing generator having an exposure area disposed axially of the orbit of said supporting device,

the reflector elements of said group area being arranged and mounted in a series of generally horizontally extending rows and in a series of transversely extending rows, each of said series having a centrally disposed row,

means for mounting said individual reflectors for freedom of oscillatory tilting on horizontal axes and also on axes extending perpendicularly to said horizontal axes, and

actuator driving means connected between said tilting frame and all of said individual reflector elements, with the exception of those elements extending in said central rows, for variably tilting and oscillating said non-excepted reflector elements on both horizontal and transverse axes to cause all of said non-excepted reflectors during cyclical operation of said system in response to tilting movements of said frame to constantly focus upon said exposure area of the generator.

3,905,353
BLOOD PRESSURE APPARATUS

Abraham Lichowsky, Los Angeles, Calif., assignor to Medical Monitors, Inc., Los Angeles, Calif.

Filed Feb. 28, 1974, Ser. No. 446,754
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 G 5 Claims

1. A blood pressure apparatus comprising, in combination:

a. a pneumatically sealed reservoir having outlet and inlet tubes communicating with its interior;

b. inflatable pressure means exterior of said reservoir connected to said tubes and arranged to block off blood flow in a portion of a person's circulatory system when inflated to a given pressure;

c. pump means connected to the outlet tube for pumping air from said reservoir into said inflatable pressure means when energized;

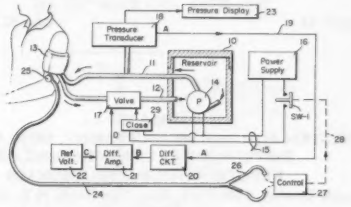
d. means for energizing said pump means;

e. an electrically controlled valve connected to said inlet tube for passing air from said inflatable pressure means back into said reservoir in a controlled manner after said given pressure is reached to cause a continuous gradual decrease in the pressure;

f. pressure transducer means responsive to pressure in said inflatable pressure means for generating an analog signal constituting a function of said pressure; and

g. feedback means connected between said pressure transducer means and said electrically controlled valve, said feedback means including:

1. means responsive to said analog signal to provide a a singal level proportional to the slope of the analog signal generated in response to said gradual decrease in pressure;



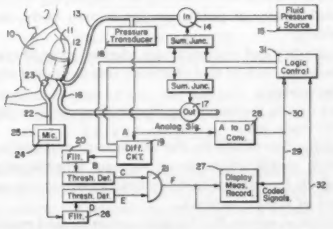
2. a reference signal level generating means; and,

3. means for generating an error signal in response to any difference in said signal level proportional to the slope of said analog signal, and said reference signal level, for controlling the action of said valve to correct any deviation in said slope from a desired constant value to thereby provide a given constant rate of pressure drop in said inflatable pressure means, whereby a doctor can energize said pump means to close off said blood flow when said given pressure is attained and then listen to acoustic pulses with a stethoscope to determine systolic and diastolic blood pressure with assurance that the rate of pressure decrease in said inflatable pressure means remains contant.

3,905,354
BLOOD PRESSURE MEASURING SYSTEM

Abraham Lichowsky, Los Angeles, Calif., assignor to Medical Monitors, Inc., Los Angeles, Calif.

Filed Feb. 19, 1974, Ser. No. 443,442
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 M 7 Claims



1. A method of automatically measuring a patient's systolic and diastolic blood pressure comprising the steps of:

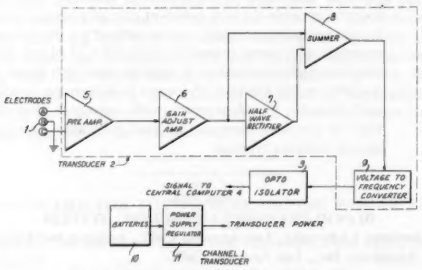
a. applying pressure to close off blood flow to a portion of the patient;
b. detecting pressure pulses corresponding to the patient's heartbeat;
c. decreasing the applied pressure gradually;
d. generating quantized pressure signals in response to said pressure pulses to provide individually defined pressure signals of uniform amplitude;
e. detecting acoustic pulses in said portion of the patient as the applied pressure is being decreased;
f. generating quantized signals in response to said acoustic pulses to provide individually defined acoustic signals of uniform amplitude;
g. correlating said pressure signals and acoustic signals to provide an output signal only when a pressure signal occurs simultaneously with an acoustic signal; and,
h. utilizing said output signals to provide indications of pressure being applied at the start and termination of the output signals, whereby the patient's systolic and diastolic blood pressures are respectively measured.

3,905,355

SYSTEM FOR THE MEASUREMENT, DISPLAY AND INSTRUMENTAL CONDITIONING OF ELECTROMYOGRAPHIC SIGNALS

Joseph Brudny, 1045 Park Ave., New York, N.Y. 10028

Filed Dec. 6, 1973, Ser. No. 422,129
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.1 M **2 Claims**



1. An apparatus for obtaining and displaying muscle activity at a multiplicity of points on the human body, said device comprising:

a multiplicity of electrode sets adapted to be in contact with the skin, each of said electrode sets including two or more electrodes,

input means for receiving signals from said multiplicity of electrode sets,

amplification means for the amplification of said signals, full wave rectification means for said amplification of said signals for each of said multiplicity of signals representative of muscle activity,

conversion means for the conversion of said multiplicity of said full wave rectified signals into pulse signals whose frequency is proportional to said full wave rectified signals, the latter being representative of muscle activity,

isolation means connected to said conversion means by which said multiplicity of pulse signals is converted into a multiplicity of light signals,

a multiplicity of detection means associated with the multiplicity of light signals by which said light signals are converted into electrical pulses proportional to the repetition of said multiplicity of light signals,

a multiplicity of integration means including multi-point switching means connected to said multiplicity of detection means wherein a multiplicity of muscle signals is integrated by summation of the multiplicity of pulses produced by said multiplicity of detection means,

feedback means connected to said multiplicity of integration means wherein a multiplicity of signals subject to normal recognition by the normally functioning human senses are produced therefrom, said feedback means comprising:

a multiplicity of scale adjustment means wherein said integration may be adjusted in relation to the frequency of said pulses representative of muscle activity wherein the total number of accumulated pulses representative of the integrated muscle signal may be adjusted by insertion of said pulses into said multi-point switching means of said multiplicity of integration means,

a multiplicity of storage means by which the multiplicity of accumulated pulses associated with the said multiplicity of integration means may be stored for predetermined periods of time, such storage means retaining a continuous representation of the multiplicity of rectified muscle signals,

programming means whereby the contents of the multiplicity of storage means may be periodically changed and whereby the contents of said multiplicity of integration means may be initiated at zero, thereby preparing them for accumulation of pulses representative of muscle activity during a subsequent time period,

a multiplicity of conversion means whereby the said number of pulses stored in said multiplicity of storage means is converted therefrom into a voltage proportional to said number of pulses,

display means connected to any of the said multiplicity of storage means whereby the contents of said multiplicity of storage means may be displayed on a digital display device,

oscilloscope means including a cathode ray tube connected to said second mentioned multiplicity of conversion means whereby the voltage or signal from any and all of the said second mentioned multiplicity of conversion means may be displayed on said oscilloscope means as a continuous trace on the cathode ray tube of said oscilloscope means,

adjustable reference means connected to said cathode ray tube,

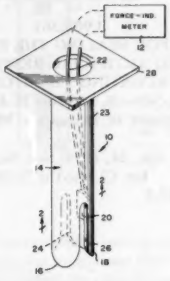
comparison means connected to any of said second mentioned multiplicity of conversion means wherein the signals from any of the second mentioned multiplicity of conversion means may be compared to said adjustable reference means, said comparison means producing signals proportional to the difference between the signals of said second mentioned multiplicity of conversion means and said adjustable reference means, and signals indicative of when said adjustable reference means is larger or smaller than the signals from said second mentioned conversion means,

audio means whereby the intensity of a tone may be adjusted in accordance with the output signal of the comparison means, such audio means being selected so as to be put at its maximum intensity when the signal from said second mentioned conversion means is larger than said adjustable reference means, or when the signal from said second mentioned multiplicity of conversion means is smaller than said adjustable reference means, or whose intensity is proportional to the difference between said reference means signal and the signal from said second mentioned multiplicity of conversion means.

3,905,356
SUBMINIATURE INSERTABLE FORCE TRANSDUCER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert H. Silver, Van Nuys, Calif.; Gilbert W. Lewis, Arcadia, Calif.; Cyril Feldstein, Sierra Madre, Calif., and Edward N. Duran, Pasadena, Calif.

Filed May 15, 1974, Ser. No. 470,429
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **6 Claims**



1. Apparatus for measuring forces in a body of material comprising:

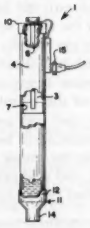
a material penetrator including a plurality of tines with tapered outer ends for penetrating a body of material; and strain gauge means coupled to said penetrator to measure deflections of at least one of said tines;

said penetrator including a tube of substantially circular cross section, with a pair of substantially longitudinally-extending slots at one end forming a pair of curved tines, whereby to facilitate rotation of the penetrator to measure stresses in different directions.

3,905,357
CUSHION MAINTAINING DEVICE FOR WATER SERVICE LINES

Theodore J. Ismert, 4000 Main St., Grandview, Mo. 64030

Filed May 13, 1974, Ser. No. 469,237
Int. Cl.² F16L *55/04*
U.S. Cl. 138—26 **10 Claims**



1. A cushion maintaining device for water service lines, said device comprising:

a. body walls defining a chamber having a closed upper end and a lower end mounted on a water service line with communication between said chamber and the water service line whereby water under pressure will enter the lower portion of said chamber and rise to a level compressing trapped gas thereabove to a pressure equalling the water pressure;

b. means within said body chamber defining first and second electrodes positioned in spaced apart relation and for contact with water in said chamber when the water rises to a predetermined level therein;

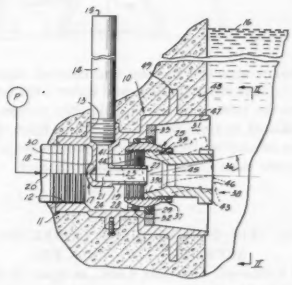
c. means defining an electric circuit connecting said first and second electrodes to a source of electrical current with the water in the chamber completing the circuit when contacting said electrodes and interrupting the circuit when the water level is lowered below at least one of said electrodes; and

d. means responsive to the completed electric circuit for converting a portion of the water contained in the body chamber into gases under pressure above the water level until the accummulation of gases causes the water level to lower below the predetermined level thereby interrupting the electric circuit.

3,905,358
HYDRO-AIR FITTING

Virgil Jacuzzi, Islington, Canada, assignor to Jacuzzi Bros., Incorporated, Little Rock, Ark.

Filed Mar. 18, 1974, Ser. No. 451,806
Int. Cl.² A61H *9/00;* **A47K** *3/00*
U.S. Cl. 128—66 **12 Claims**



1. The method of aerating a hydrotherapeutic stream which includes the steps of:

1. at a first point in a hydraulic circuit pressurizing a supply of liquid to form a stream,
2. driving the stream at increased velocity along a fixed axis past a second point in the circuit,
3. spoiling the stream between the first and second points to render the flow of the stream turbulent,
4. admixing air into the center of the stream at said second point in the circuit by flowing the turbulent stream around the edges of a radial air port disposed in the stream at said axis,
5. successively constricting and expanding the flow stream downstream of said second point to mix the air into the water in the form of small bubbles to form an aerated therapeutic stream, and
6. selectively redirecting the aerated therapeutic stream in different directions of angular variation from said axis.

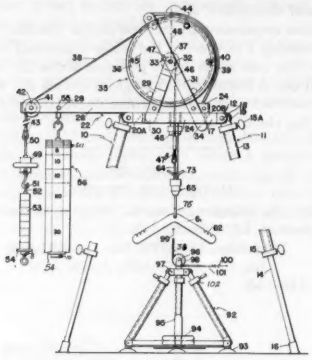
3,905,359
TRACTION DEVICE

William G. Fanstone, General Delivery, Malachi, Ontario, Canada

Continuation-in-part of Ser. No. 349,657, Apr. 10, 1973, abandoned. This application June 14, 1974, Ser. No. 479,299
Int. Cl.² A61H *1/02*
U.S. Cl. 128—75 **18 Claims**

17. In a traction device for applying and maintaining specified amounts of traction to a patient and which includes supporting structure; the improvement comprising a pulley frame, a double pulley assembly journalled for rotation in a vertical plane within said pulley frame, said double pulley assembly including a major pulley and a minor pulley secured to and concentrically mounted to said major pulley, said major pulley

having a diameter larger than the diameter of said minor pulley, cable means secured by one end thereof adjacent to the periphery of said major pulley, adjustable weight means detachably securable directly to the other end of said cable means and acting vertically downwardly with the same force regardless of the rotative position of said pulley assembly,



flexible means attached by one end thereof adjacent to the periphery of said minor pulley, and halter attachment means secured to the other end of said flexible means, said cable means and said flexible means extending from the adjacent peripheries of said major and minor pulleys respectively and upon opposite sides of the vertical axis thereof.

3,905,360

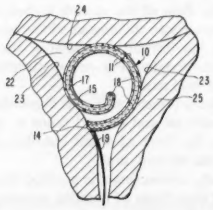
INTRAUTERINE DEVICE FOR GOVERNING THE REPRODUCTIVE PROCESS

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 194,222, Nov. 1, 1971, abandoned. This application July 23, 1973, Ser. No. 381,404. The portion of the term of this patent subsequent to Dec. 8, 1992, has been disclaimed.

Int. Cl.[2] A61F *5/46*

U.S. Cl. 128—130 **6 Claims**



1. An intrauterine device for the administration of an antifertility agent at a controlled rate for a prolonged period of at least one month, said device consisting essentially of;

a. a reservoir comprising dissolved antifertility agent and undissolved replacement antifertility agent selected from the group consisting of progestational and estrogenic steroids in a liquid core material permeable to the passage of agent, the replacement agent present in an amount sufficient to maintain the dissolved agent in an amount substantially equal to the amount of dissolved agent originally present in the core during said prolonged period, said reservoir surrounded by;

b. a shaped wall having two free closed ends with one end extended around the other end and receded from it with a radius of about one centimeter to two and one-half centimeters to define the device adapted for insertion and placement within a uterus, said wall formed of a release rate controlling permeable to the passage of agent with the permeability of the wall to the agent lower than the permeability of the core to the agent; and,

c. said device when placed in the uterus releasing dissolved agent from the reservoir in a contraceptively effective amount by metered passage through the wall, the agent so released being replaced by the continuous dissolving of replacement agent in the core material.

3,905,361

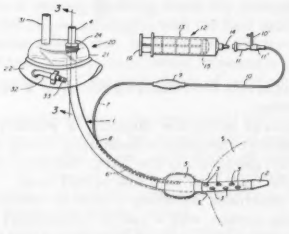
APPARATUS FOR SEALING THE ESOPHAGUS AND PROVIDING ARTIFICIAL RESPIRATION AND EVACUATING THE STOMACH

John R. Hewson, Norwell, and Roy H. Hewson, Carver, both of Mass., assignors to Brunswick Mfg. Co., Inc., North Quincy, Mass.

Filed Apr. 24, 1974, Ser. No. 463,585

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—145.5 **11 Claims**



8. Apparatus for medical purposes comprising,

an elongated member constructed and arranged to be inserted into the esophagus and having outer and inner ends,

an expandable element carried by the member in the vicinity of its inner end,

means for causing the element to expand so as to form an effective seal isolating the stomach from the lungs of a patient,

a face mask connected to the elongated member in the vicinity of its outer end with said face mask having means for forming a seal with the face of a patient,

an opening through the mask to the inside thereof for introducing ventilating gas therein which may pass through the nose and/or mouth and trachea to the patient's lungs,

said elongated member being tubular with a port adjacent to the outer end of the member and a port located adjacent to the inner end and containing a duct which provides fluid communication between the ports,

a second opening in the mask through which the tubular member extends, and said port adjacent the outer end of the tubular member lying outside said mask.

3,905,362

VOLUME-RATE RESPIRATOR SYSTEM AND METHOD

Theodore B. Eyrick, Reading; Allen C. Brown, Acton, and Neil R. Hattes, Danvers, all of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,677

Int. Cl.[2] A61M *16/00*

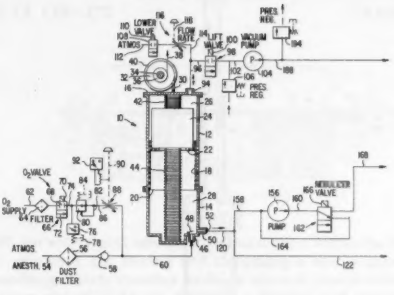
U.S. Cl. 128—145.8 **52 Claims**

1. In a respirator system,

a breathing gas delivery cylinder including a housing and piston means dividing said housing into an upper control chamber and a lower delivery chamber;

means for producing a vacuum in said control chamber for lifting said piston means to expand said delivery chamber;

means for releasing said vacuum to lower said piston means and thereby compress said delivery chamber;



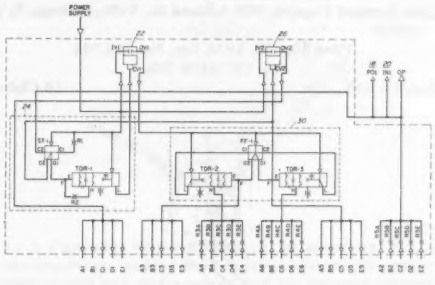
control means for periodically and alternately energizing said vacuum producing means and said vacuum releasing means for drawing breathing gas into said delivery chamber and for discharging said breathing gas;

delivery means connected to said discharge means for directing said breathing gas to a patient.

3,905,363
DUAL MODE FLUIDIC VENTILATOR

Irving C. Dudley, Mendon, Mass., assignor to Ram Research Incorporated, Boston, Mass.

Filed Nov. 19, 1973, Ser. No. 417,351
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **12 Claims**



1. A ventilator for controlling the flow of a fluid to a user, which comprises:

a. means to deliver a ventilating fluid to a user, including at least one conduit communicating with the user;

b. switching means operable between a first mode to place the ventilator in a demand ventilation mode and a second mode to place the ventilator in a controlled ventilation mode, said switching means responsive to a signal from the conduit to effect its changes between modes;

c. a first fluid amplifier responsive to the switching means in its first mode and in communication with the conduit to provide the ventilating flow to the user in the demand ventilation mode;

d. at least one tidal volume restrictor downstream of the first fluid amplifier to control the volume of the ventilating fluid flowing to the user in either the controlled or demand ventilation mode; and

e. a controlled ventilation mode circuit responsive to the switching means in its second mode and in communication with the means to provide the ventilating flow to the user, said ventilation mode circuit including:

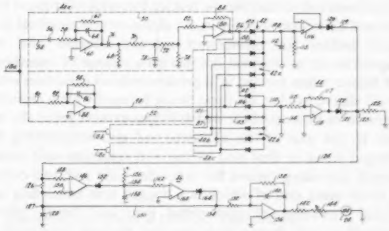
i. means responsive to the switching means in the second mode, said means actuatable between first and second states; and

ii. first and second timing means in combination with the means responsive to the switching means, the first timing means in communication with the means responsive to the switching means in its first state, and the second timing means in communication with the means responsive to the switching means in its second state to control the rate at which the ventilating fluid flows to the user.

3,905,364
ARTIFACT DETECTOR

Michael J. Cudahy, Nashota, and Robert D. Sherwood, Wauwatosa, both of Wis., assignors to Marquette Electronics, Inc., Milwaukee, Wis.

Filed Apr. 17, 1974, Ser. No. 461,610
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 R **17 Claims**



13. An artifact detector for detecting periodic artifacts in a plurality of electrocardiographic data, said artifacts having a frequency greater than the electrocardiographic signal produced by the functioning of the heart, said artifact detector comprising:

a plurality of detection circuitries, each including an amplifier having an input for connection to one of the sources of the electrocardiographic data and an output, and a band pass filter coupled to the output of said amplifier, said band pass filter having frequency response characteristics suitable for transmitting signals having frequencies of the artifacts, each of said detection circuitries having an output providing a periodic signal corresponding to the signal artifacts;

conversion means including selection means to which said outputs of said detection circuitries are coupled in parallel and including comparison means connected between said selection means and an output terminal, said selection means splitting the periodic signals of said detection circuitries into positive and negative portion signals having magnitudes determined by the magnitude of the periodic signals and providing the largest positive portion signal and the largest negative portion signal to said comparison means, said comparison means providing the largest of the portion signals as a unipolarity signal at said output terminal; and

indicating means coupled to the output terminal of said conversion means and responsive to the magnitude of said unipolarity signal for indicating the presence and magnitude artifacts in the electrocardiographic data.

3,905,365

DENTAL INJECTION GUN

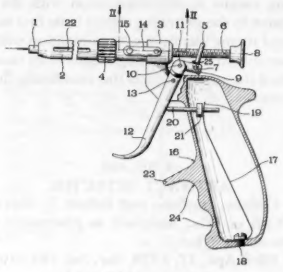
Americo Colombo, via Partigiani 24, Como, Italy

Filed Nov. 23, 1973, Ser. No. 418,315

Claims priority, application Italy, Nov. 25, 1972, 7358/72

Int. Cl.[2] A61M *5/315;* **G01F** *11/06*

U.S. Cl. 128—218 C **4 Claims**



1. A dental injection gun comprising a frame having a portion thereof shaped to provide a pistol grip, an elongate sleeve holder integral with the frame and being oriented substantially perpendicularly relative to the pistol grip portion of the frame, an elongate sleeve adapted to hold a syringe and being detachably connected to said sleeve holder for axial alignment therewith and extension therefrom, an elongate rod received in said sleeve holder for movement relative thereto and being adapted to act at one end thereof on a charge of anesthetic in said sleeve when moved in a predetermined direction relative to said sleeve holder, said rod being formed with a plurality of ridges on its outer surface which ridges extend generally transverse to the axis of the elongate rod and terminating in an enlarged head at that end of the rod opposite said one end thereof, actuating means for actuating said rod and comprising lever arms one of which is a trigger arm extending in the general direction of said pistol grip and being pivotally mounted to said frame with one end thereof proximate said rod and its opposite free end normally urged in a direction away from the pistol grip portion of the frame, said lever arms including a double arm bracket pivotally mounted at one end thereof to said one end of said trigger arm, a lug disposed generally transversely to the axis of the rod and being mounted to the opposite end of the bracket for pivotal movement about an axis transverse to the axis of the rod, said lug being formed with a hole of a diameter slightly larger than the largest diameter of the ridges on said rod, the latter passing through said hole in said lug, and torsion spring means for normally urging said lug into an inclined position in a direction opposite to the direction of advancement of said rod by said actuating means and in which position of the lug the surface defining said hole being in gripping engagement with the ridges on the rod, said lug being movable into an oppositely inclined position through an intermediate perpendicular position.

3,905,366

INJECTION SYRINGE WITH SHIFTABLE COMPARISON INDICATOR

George Edgar Callahan, Feldstrasse 34, D-4000 Dusseldorf-Nord, and Lothar Barensfeld, Rommerscheider Strasse 143, D-5070 Bergisch Gladbach, both of Germany

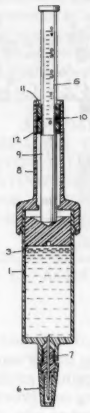
Filed Aug. 1, 1973, Ser. No. 384,706

Claims priority, application Switzerland, Aug. 3, 1972, 11532/72

Int. Cl.[2] A61M *5/315;* **A61J** *1/06*

U.S. Cl. 128—218 C **9 Claims**

1. Injection syringe comprising cylinder means having a closed end receiving one end of a cannula therethrough, a piston in said cylinder means, means for shifting said piston longitudinally in said cylinder means to dispense a dose of fluid from said cylinder through the cannula, a dosage scale associated with said means for shifting said piston, and a dosage comparison indicator positioned in a portion of said



cylinder means to indicate the dosage discharged upon movement of said piston in said cylinder means, said indicator being shiftable in said cylinder to reset the dosage indication at the starting point after each discharge.

3,905,367

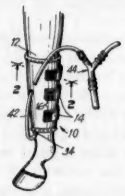
LIMB COOLING APPARATUS

John Bernard Dapcich, 903 Ashland St., Valley Cottage, N.Y. 10989

Filed May 10, 1974, Ser. No. 468,742

Int. Cl.[2] A61F *7/00*

U.S. Cl. 128—254 **18 Claims**

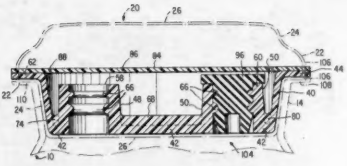


1. A limb cooling apparatus for cooling the legs of a horse or the like adapted to be connectible to a water supply comprising: a flexible wrap having an impermeable outer surface, flexible fluid conveying means in the form of a tubular conduit disposed in said wrap and having passage means for discharging the fluid conveyed by said flexible conveying means; said conduit having a closed end and being disposed along at least one marginal edge of said wrap; said passage means comprising a plurality of apertures extending from said closed end and being disposed along the upper portion of said wrap when in use so as to permit the fluid adapted to be discharged from said apertures to flow downwardly against the inner surface of said wrap and along said limb portion; and means securing said wrap in position on a limb, wherein said flexible wrap may be conformably applied around and held in place about substantially any portion of a limb in an encircling condition.

3,905,368
PIERCEABLE ACCESS PORT ASSEMBLY

Dan Lewis, Jr., Concord; Raymond D. Von Alven, San Raphael, and Myron R. Prouty, Oakland, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Feb. 15, 1974, Ser. No. 443,011
Int. Cl. A61j *1/00*
U.S. Cl. 128—272 **33 Claims**

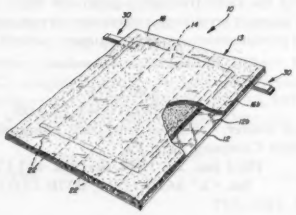


28. An access port assembly for installation within the neck of a container for storing and dispensing a sterile solution comprising a body member having a sidewall means defining an open end of said body member, a bottom wall extending from the end of said sidewall means opposite said body member open end to close one end of said body member, and at least one access port extending from said bottom wall in spaced relationship to said sidewall means and terminating at a terminal end adjacent to the open end of said body member but positioned within the confines of said sidewall means.

3,905,369
DIAPER WITH ADHESIVE TABS

James M. Kyte, Rumson, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 10, 1973, Ser. No. 387,402
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **10 Claims**

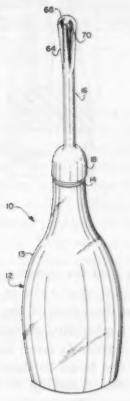


1. A disposable diaper comprising an absorbent pad; a water-impervious backing sheet in juxtaposition with a major surface of said pad; and a pair of tape tab fasteners adhered at end portions thereof to opposite side portions of said backing sheet near one end thereof on the surface opposite said absorbent pad, said fasteners having free end portions opposite said adhered end portions, each of said fasteners including a flexible substrate having a normally tacky and pressure-sensitive adhesive coating on one major surface thereof and a release sheet having width and length dimensions equal to those of said substrate and being precisely coterminous with said substrate at said free end portion, an end portion of said release sheet being adhered to an end portion of said adhesive coating with the adhered portions in registry, the other end portion of said release sheet being folded back on itself to provide a pull tab, thus leaving uncovered the adhesive coating at the other end of each of said fasteners to provide the means for adhering the tape tab fasteners to the backing sheet of the diaper as aforesaid, each of the surfaces of said substrate being receptive to strong adherence by said adhesive coating, said release sheet having an average attachment force to said adhesive coating of between about 300 and about 700 grams per 2¾ inches of width, measured by a TLMI tester under the conditions of TAPPI Test Method T402m.

3,905,370
DISPOSABLE DOUCHE PRODUCT

John P. Lazdowski, Franklin, Mass., assignor to International Paper Company, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,915
Int. Cl.² A61M *1/00*
U.S. Cl. 128—232 **6 Claims**



1. A disposable douche product comprising:

a. a flexible container having a body and a head at one end thereof at least a portion of which has a greater radial rigidity than the body, the head including a neck extending from the container, an annular collar integrally formed on the neck and spaced from the container, the collar having opposed sloped shoulders forming a tapered collar, a first passageway through said head, a plug integrally formed on the exterior surface of the end of said head distal from the container and obturating said passageway, said plug having a weakened section to facilitate severing said plug from said head and opening said passageway;

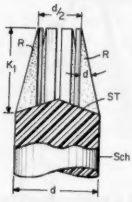
b. a douching liquid sealed within said container, the quantity of said liquid being that needed for a single application; and

c. a pipe adapted to be sealingly snap-fitted onto the exterior surface of said head after said plug is severed from said head, said pipe including an annular skirt base portion defining a cavity therein and an annular recess spaced from the proximate end of the base, the proximate base end being the end adapted to be closest to the container when the pipe is mounted on the container head, the recess being formed in the interior surface of the skirt and conforming to the mating shape of said collar, an elongated flexible nozzle section having a second passageway therethrough communicating with said cavity, a plurality of apertures through the distal end of said nozzle section communicating with said second passageway, said first and second passageways being in flow communication when said plug is severed from said head and said pipe is mounted on said head whereby squeezing said container effects ejecting said douching liquid through said apertures.

3,905,371
INOCULATING TOOLS FOR CUTANEOUS VACCINATION USING A DRY VACCINE

Helmut Stickl, 6 Starenweg, D 8033 Krailling, and Volker Hochstein-Mintzel, 21 Waldstrasse, D 8022 Grafelfing, both of Germany

Filed Oct. 10, 1973, Ser. No. 405,068
Claims priority, application Germany, Oct. 13, 1972, 2250293
Int. Cl.² A61B 17/20
U.S. Cl. 128—253 13 Claims

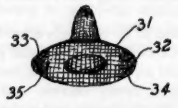


1. An inoculating tool for cutaneous smallpox vaccination using dry vaccine and having a shank terminating in a head of smaller cross-section than that of the shank, said head having a coaxial bore and a plurality of radially extending slot-like incisions extending outwardly from the bore and enclosing the longitudinal axis of the head to thereby define a plurality of serrations, each serration having an inwardly facing wall or edge extending substantially parallel to the longitudinal axis of the head, the walls of the serrations defined by the incisions having a roughened surface so as to permit positive locking of the dried vaccine in the area between the serrations and also extending substantially parallel to the longitudinal axis of the head, facing walls of adjacent serrations being parallel and extending radially of the head.

3,905,372
FEMININE HYGIENE PROTECTIVE SHIELD

Marian C. Denkinger, 88-35 Elmhurst Ave., Elmhurst, N.Y. 11373

Filed June 20, 1974, Ser. No. 481,394
Int. Cl. A61f 13/00, 5/46, 13/20
U.S. Cl. 128—285 5 Claims



1. A tampon adapted for insertion between the internal labia of the vulva for sole support therein, in longitudinal relationship to the vaginal orifice, a tampon means for absorbing body fluids comprising

a support pad of gauze material for insertion between the labia at the vaginal orifice,

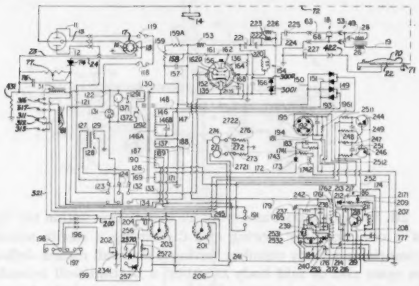
said pad being of absorbent material,

an essentially hollow conical upstanding absorbent gauze projection, attached to said gauze pad and suitably shaped for insertion into the vaginal orifice.

3,905,373
ELECTROSURGICAL DEVICE

Donald I. Gonser, Forest Park, Ohio, assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Apr. 18, 1974, Ser. No. 461,983
Int. Cl.² A61B 17/36; A61N 3/02
U.S. Cl. 128—303.14 6 Claims

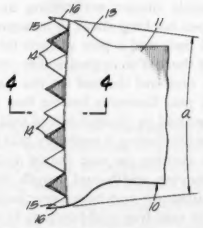


5. In combination with a radio-frequency electrosurgical device which includes a radio-frequency generator, power source means for supplying power to the radio-frequency generator, circuit means connected to the radio-frequency generator for performing electrosurgery on a patient, said circuit means establishing a first current return path from the patient to the radio-frequency generator when connected to the patient, means for establishing an alternate current return path for at least part of said first current return path from the patient to the radio-frequency generator, a monitoring system means connected to the alternate current return path for sensing radio-frequency current passing in said alternate current return path, and means connected to the monitoring system means for disabling the power source means from powering the radio-frequency generator when the radio-frequency current level in the alternate current return path exceeds a predetermined radio-frequency current level.

3,905,374
KNEE OSTEOTOMY BLADE

Roy Paul Winter, Santa Barbara, Calif., assignor to American Sterilizer Company, Erie, Pa.

Filed Jan. 28, 1974, Ser. No. 437,174
Int. Cl.² A61B 17/14; B27B 33/02
U.S. Cl. 128—317 2 Claims

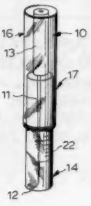


1. A blade of the type described, comprising a metal arm extending from a hub at one end to a cutting head at the other end, a driver fixed to the hub for oscillating the arm in a plane about the axis of the driver, the cutting head having an arcuate series of teeth, to cut a groove, a half-tooth being provided at each end of said series, the outer surface of each half-tooth being undercut to prevent packing of cuttings at blind ends of the groove being cut.

3,905,375
ACUPUNCTURE NEEDLE

Philip M. Toyama, 400 Staffordshire Rd., Winston-Salem, N.C. 27104

Filed Jan. 23, 1974, Ser. No. 435,990
Int. Cl.² A61B *17/34*
U.S. Cl. 128—329 A 13 Claims

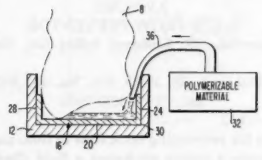


1. A device for practicing acupuncture wherein needles are utilized to penetrate beneath the skin comprising:
   a needle having a shank for insertion through the skin and a handle which remains exposed after the shank is inserted,
   a shield for protecting the shank from tactile contact prior to inserting the shank, and
   means for releasably securing the needle to the shield with the shank disposed completely within the shield wherein said releasable securing means includes plunger means which engages both the handle and the shield and which projects said shank from said shield as said needle is inserted beneath the skin and is released from the shield.

3,905,376
PEDICURE PROSTHESIS FOR THE METATARSAL ARCH OF THE FOOT

Amos N. Johnson, Garland, and Richard D. Gilbert, Raleigh, both of N.C., assignors to Amos N. Johnson, Garland, N.C.

Continuation-in-part of Ser. No. 165,610, July 23, 1971, Pat. No. 3,782,390. This application Oct. 30, 1973, Ser. No. 411,099
Int. Cl.² A61F *5/14*
U.S. Cl. 128—595 21 Claims

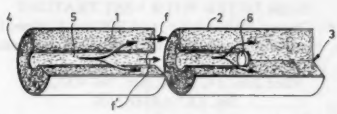


1. The process for preparing a prosthesis for supporting or restraining a part of the body which comprises: (a) placing a fluid, curable, non-foamable material in a prosthesis enclosure, said fuid self-curable material being comprised of an admixture of a cross-linkable prepolymerized material and an ethylenically unsaturated monomer, and (b) curing in situ said fluid curable material at a temperature between 59° and 120°F. to form a rigid cured material which conforms to the shape of the affected portion of the body and which has essentially the same volume in the pre-cured states as in the cured state, there being no gas given off during the curing.

3,905,377
CIGARETTE HAVING A BLIND CONDUIT

George Alexandre Yatrides, 2 rue Pierre Termier, 38 Grenoble, France

Continuation of Ser. No. 108,395, Jan. 21, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,582
Claims priority, application France, Jan. 23, 1970, 70.02365
Int. Cl.² A24B *15/027*; A24D *1/04*; A24F *25/00*
U.S. Cl. 131—9 7 Claims

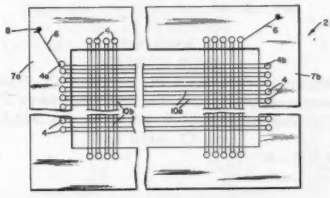


1. In a cigarette or the like comprising an elongated body of tobacco laterally encircled by a wrapper, said cigarette having an end to be lit and a suction end; the improvement in which the body of tobacco has an air-permeable duct extending longitudinally thereof from said lit end and terminating at a distance from said suction end in a fluid-impervious end wall that occupies only a central portion of said body of tobacco and that is spaced inwardly from said wrapper, said end wall defining between itself and said wrapper an annulus filled entirely with tobacco, the tobacco of said body extending a substantial distance on the side of said end wall which is opposite said duct, the side walls of said duct being airpermeable, said end wall having a diameter about the same as the internal diameter of said duct.

3,905,378
HAIRPIECE WITH MOLECULARLY BONDED FOUNDATION AND METHOD FOR MAKING SAME

Donald Levin, Los Angeles, and Walter D. Ward, Newport Beach, both of Calif., assignors to Esthetic Hair, Inc., Los Angeles, Calif.

Filed Mar. 29, 1974, Ser. No. 456,277
Int. Cl.² A41G *3/00*
U.S. Cl. 132—5 6 Claims



1. A method for simultaneously making and styling a hairpiece according to a predetermined hair style, comprising:
   a. forming a non-woven essentially rectangularly paterned network by steps comprising:
      spacing a plurality of first filaments essentially parallel to one another in a first plane in a rectangular frame;
      spacing a plurality of second filaments essentially parallel to one another in a second plane in said frame, said second filaments being essentially perpendicular to and directly above said first filaments, said first and second planes being parallel; and
      placing said frame in a molecular bonding machine and molecularly bonding said first and second filaments at their intersections to form bond points thereat, said bonding comprising joining said first and second filaments together at their intersections under a temperature of essentially between 400° and 435° Fahrenheit

and a pressure of essentially between 53,000 psi and 63,000 psi for no longer than essentially 2 seconds;

b. shaping said network to conform to a predetermined head shape;

c. cutting said shaped network according to a predetermined pattern to form a foundation;

d. securing anchors to said foundation; and

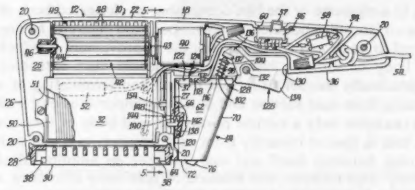
e. affixing hair fibers to said foundation according to a predetermined style.

3,905,379

HAIR DRYER WITH MIST FEATURE

Algerd C. Churas, Westchester, and William R. Hemrich, Glen Ellyn, both of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 433,333
Int. Cl.² A45D *1/00*
U.S. Cl. 132—9 **8 Claims**



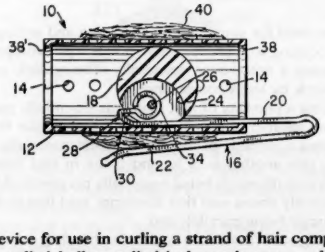
1. In a hair styling appliance of the type having a housing including a hand grip portion, a motor actuated fan mounted in said housing, air inlet and air outlet means formed in said housing, and heater means mounted in said housing between said fan and said air outlet means, a spray mist attachment comprising a body portion having a reservoir defined therein and adapted to be releasably attachable to an outer surface of said housing, a piston pump mounted in said body portion and having an inlet in communication with said reservoir, a spray nozzle mounted in said body portion in communication with the outlet of said pump and positioned adjacent said air outlet means, latch means for releasably and positively attaching said body portion to said housing, and a finger actuated lever pivotally mounted on said housing for actuating said piston pump.

3,905,380

HAIR CURLER

Jules Bontempi, 46-26 215th Pl., Bayside, N.Y. 11061

Continuation-in-part of Ser. No. 455,046, March 27, 1974. This application Sept. 9, 1974, Ser. No. 504,195
Int. Cl. A45d *2/00*
U.S. Cl. 132—40 **6 Claims**



1. A device for use in curling a strand of hair comprising:

a thin walled hollow cylindrical member over which the strand of hair is wound; and

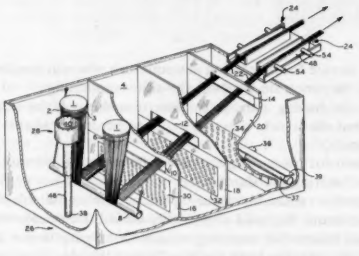
a clip assembly including a substantially spherical member having an interior chamber therewithin defining an outer wall of said spherical member, said outer wall having an aperture formed therein, and a spring clip defined by a pair of resilient opposed legs having integrally connected trailing ends, one of said legs having a leading end which passes through said aperture and which is located in said interior chamber, said leading end having an enlarged portion of greater dimension than said aperture which portion retains said leading end within said interior chamber, wherein said spherical member is movable within said cylindrical member both rotatably and longitudinally.

3,905,381

FILAMENT LIQUID QUENCHING APPARATUS

Richard D. Meyer, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,036
Int. Cl.² B08B *3/00;* **B29D** *23/06;* **B29C** *25/00*
U.S. Cl. 134—122 **5 Claims**



1. Apparatus for liquid quenching melt-spun thermoplastic filaments comprising:

a tank for storing a quench liquid;

at least one baffle in said quench tank to dampen the movement of quench liquid wherein said baffle contains an opening through which said filaments pass and a perforated area to permit circulation of said quench liquid but which reduces turbulence of said quench liquid;

a means for guiding said filaments through said tank; and

a weir to control the level of quench liquid in said tank.

2. The apparatus of claim 1 wherein at least two baffles are provided and the perforations in said baffles are progressively smaller in baffles progressively nearer to the area where the filaments enter the quench liquid.

3,905,382

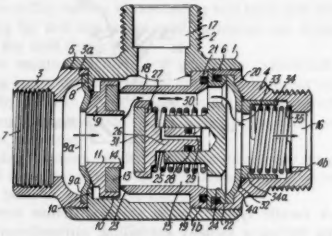
BACK FLOW PREVENTOR

William Waterston, 73, Kaikorai Valley Rd., Dunedin, New Zealand

Filed Sept. 28, 1973, Ser. No. 401,892
Int. Cl.² G05D *7/00*
U.S. Cl. 137—102 **4 Claims**

1. A device for preventing back flow in fluid supply systems which comprises a casing enclosing a fluid chamber, means defining a fluid inlet to said chamber, means defining a fluid outlet from said chamber, means defining a fluid relief outlet from said chamber between said inlet and said outlet, a reciprocable member slidably mounted within said body member adjacent said inlet, means defining a valve seat for said inlet on said reciprocable member, a valve member mounted in said chamber, a biasing means for said valve member to bias said valve member to close against said valve seat, a sleeve member mounted within said chamber coaxially of said valve seat, said sleeve member having an upstream end, a valve seat for said relief outlet provided at the upstream end of said sleeve member, said reciprocable member being movable into engagement with said valve seat for the relief outlet by pressure on its upstream face and being movable to open the valve

seat for the relief outlet when pressure build-up in the chamber due to back flow exceeds a further predetermined pressure, the effective pressure area of said upstream face being substantially equivalent to the effective pressure area of the valve seat for the relief outlet, the arrangement being such that said pressure build-up and said bias first moves said valve



member to close off said inlet before movement of said reciprocable member to open said valve seat for the relief outlet to effect fluid communication between said chamber and said relief outlet, whereby said valve seat is opened without needing to overcome a pressure differential across the relief valve seat caused by a lower pressure existing in the relief outlet.

3,905,383

HYDRAULIC CONTROL DEVICE

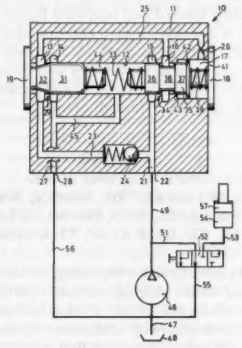
Gunther Schwerin, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 24, 1974, Ser. No. 517,809

Claims priority, application Germany, Nov. 30, 1973, 2359755

Int. Cl.² G05D *16/10*

U.S. Cl. 137—110 **11 Claims**



1. A hydraulic control device, comprising a housing having a first port for connection to a source of pressure fluid, a second port for connection to a reservoir, and passage means connecting said ports; a pressure limiting valve interposed in said passage means for limiting the pressure in said first port; and means for controlling the communication between said ports in dependence upon the pressure in said first port, comprising a spring-loaded relief valve in said passage means intermediate said second port and said pressure limiting valve and in series with said pressure limiting valve, and a switching valve in said passage means parallel to said pressure limiting valve intermediate said first port and said relief valve and being controlled by the pressure which prevails ahead of said relief valve.

3,905,384

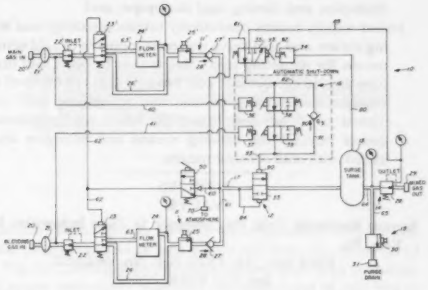
GAS PROPORTIONER MEANS AND METHOD

James E. Berger, 52 Harwich Rd., Newton, Mass. 02167

Filed Jan. 22, 1974, Ser. No. 435,417

Int. Cl.² F16K *17/00*

U.S. Cl. 137—111 **4 Claims**



1. In a fluid proportioner for obtaining a predetermined mixture of two fluids supplied from first and second different fluid sources, the improvement comprising,

pressure responsive means for stopping fluid flow of both said fluids through said proportioner in response to an indication that one of said sources has fallen below a predetermined supply pressure,

said pressure responsive means utilizing fluid pressure from said fluid sources for actuation without the need for auxiliary power,

said fluid proportioner having first and second flow meters connected to said first and second fluid sources for reading flow therefrom during initial calibration of said fluid proportioner,

and bypass means for causing fluid bypass of said flow meters during normal operation of said fluid proportioner after said initial calibration.

3,905,385

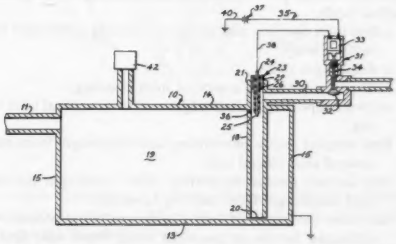
STEAM TRAP

Edwin Laurence Green, P.O. Box 1127, Twin Falls, Idaho 83301

Filed Apr. 29, 1974, Ser. No. 465,090

Int. Cl.² F16T *1/00*

U.S. Cl. 137—187 **2 Claims**



1. A steam trap for separating pressurized steam from water condensate comprising:

an enclosed holding tank for receiving pressurized steam and water condensate from a steam pipe leading into the tank,

an upright standpipe extending into the tank and having a bottom opening adjacent the bottom of the tank;

sensing means within the standpipe and elevationally lo-

cated within the tank for sensing presence of condensate at a prescribed level within the standpipe and tank;

a drainpipe openly communicating with said standpipe at a location elevationally above said prescribed level;

a relief aperture formed through said standpipe elevationally above said prescribed level for allowing escape of gas from within said standpipe as condensate raises therein: valve means mounted on said standpipe for opening the drainpipe and closing said drainpipe; and

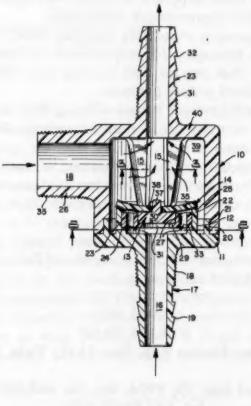
power supply means operatively interconnecting said sensing means and said valve means responsive to said sensing means for actuating said valve means to open said drainpipe as said condensate reaches said prescribed level and engages said sensing means, and to actuate said valve means to close said drainpipe when said condensate passes beyond the sensing means and becomes disengaged with said sensing means.

3,905,386

VALVE

Eugene Rachocki, Erie, Pa., assignor to Zurn Industries, Inc., Erie, Pa.

Filed Apr. 22, 1974, Ser. No. 462,652
Int. Cl.² F16K *24/00*
U.S. Cl. 137—215 **5 Claims**



1. A valve comprising a housing in the form of a hollow cylinder with an end cap fixed to said housing forming a closed hollow body,

a first inlet opening and an outlet opening connected to said hollow body,

a diaphragm plate,

said end cap having a second inlet opening,

means supporting a diaphragm over said second inlet opening,

first support means preventing said diaphragm from moving toward said closed end,

and second means supporting said diaphragm preventing said diaphragm from moving laterally,

the outer periphery of said diaphragm being adapted to be deflected by the pressure of water from said first inlet forcing said diaphragm into engagement with said second diaphragm support means,

said diaphragm being adapted to be deflected by water pressure from said second inlet whereby said diaphragm is deflected away from said second diaphragm support and water can flow from said second inlet to said outlet, said diaphragm plate comprising a flat circular disc having a counter bore providing a hollow space and a shoulder,

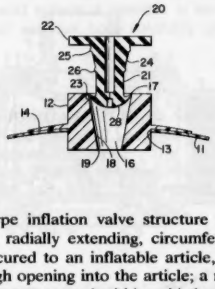
said second means resting on said shoulder

3,905,387

NEEDLE TYPE INFLATION VALVE

Munro M. Grant, 3975 Rum Row, Naples, Fla. 33940

Filed Oct. 3, 1974, Ser. No. 511,597
Int. Cl.² F16K *15/20*
U.S. Cl. 137—223 **6 Claims**



6. A needle type inflation valve structure comprising a housing having a radially extending, circumferential flange adapted to be secured to an inflatable article, said housing affording a through opening into the article; a resilient valve core comprising a stem seated within said through opening, said stem being axially perforated to receive an inflation needle and having radially extending forward and rearward flanges at forward and rearward ends thereof, respectively, said flanges radially overlapping said housing adjacent to the ends of said through opening; said through opening having one end thereof substantially larger than the other end and having a frustoconical tapering wall extending inwardly of said through opening from said larger end to said other end; a substantial portion of the axial dimension of said stem being frustoconical and tapering forwardly from said rearward flange in the same direction as and engaging said tapering wall of said through opening; said stem having integrally formed, radially projecting sealing rings disposed adjacent to the ends of said frustoconical portion of said stem and compressed tightly against said wall of said through opening; said one end of said stem and said forward flange having axially forwardly facing outer end surface portions which are rounded and curve backwardly toward said rearward flange whereby when the valve core is inserted forward end first into said larger end of said through opening, said rounded surface portions coact with said converging wall portions of said through opening to fold said forward flange backwardly and facilitate the seating of said valve core in said through opening.

3,905,388

PIPE TAPPING TOOL

Carl Chiarelli, 20 Lake End Rd., Merrick, N.Y. 11566

Filed July 25, 1973, Ser. No. 382,367
Int. Cl.² B23B *41/08;* **F16L** *41/06*
U.S. Cl. 137—318 **2 Claims**

1. A pipe tapping device comprising, in combination:

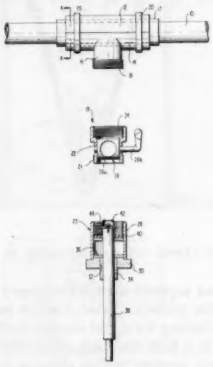
a. a sectional saddle-shaped member arranged to surround the outer wall of a length of pipe comprising a pair of semicircular bodies with at least one of said bodies having laterally extending threaded first nipple means formed integrally therewith;

b. a split pliable extent of plastic material interposed between the sectional saddle-shaped member and the pipe, said plastic material having a waterproof cement applied to at least one side thereof;

c. at least two clamp members for clamping the sectional saddle-shaped member with the plastic material in liquid-proof engagement with the pipe;

d. a control valve comprising a generally cylindrical body having screw threads formed at its two ends defining thereby second and third nipple means, a rotatably mounted apertured valve cylinder between the two ends and handle means extending from the valve cylinder and outwardly of said generally cylindrical body for rotating the valve cylinder between an open and closed position;

e. a drill shank having an outer free end including a drivable portion and a cutting bit mounting end;
f. a cutting bit;
g. travel limiting means to prevent damage to the interior wall of the pipe opposite from the portion that is apertured when the tapping operation is conducted;
h. means mounting the cutting bit and the travel limiting means to the cutting bit mounting end such that both the cutting bit and the travel limiting means are removable from the drill shank; and
i. sleeve means comprising a generally cylindrical body having screw threads formed at one end thereof defining thereby a fourth nipple means, an axially apertured plug, bushing means, guide means and replaceable sealing means, wherein:
said plug, bushing means and guide means are assembled and mounted at the other end of the generally cylindrical body of said sleeve means,



said replaceable sealing means is mounted within the generally cylindrical body of said sleeve means between the fourth nipple means and the assembled plug, bushing means and guide means,
said bushing means, guide means and sealing means when assembled with the cylindrical body of said sleeve means providing a succession of aligned apertures through which the drill shank passes for sealing and guiding same, said drill shank when so arranged being capable of both rotational and longitudinal displacement relative to the cylindrical body of said sleeve means and the bushing means, the guide means and the sealing means,
said second nipple means engages said first nipple means and said fourth nipple means engages said third nipple means during the pipe tapping operation, and
the aperture of the valve cylinder is so dimensioned that said drill shank, said cutting bit and said travel limiting means can pass therethrough during the pipe tapping operation.

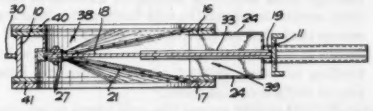
3,905,389

SLIDE VALVE ASSEMBLIES

George William Snape, London, England, assignor to Bulk Unit Load Systems Limited, London, England

Filed Nov. 30, 1973, Ser. No. 420,546
Claims priority, application United Kingdom, Nov. 30, 1972, 55431/72
Int. Cl.² F16K 7/14
U.S. Cl. 137—375 **6 Claims**

1. A slide valve assembly, comprising: an orifice having a peripheral wall, said peripheral wall having a slot therein providing walls; a flexible, membrane type bag having an open end and a closed end and adapted to extend across said orifice; means securing the open end of said bag to the walls of said slot; a flat plate type closure member movable through the fixed open end of said bag and to the closed end of the bag for closing and opening said orifice; guide means disposed on



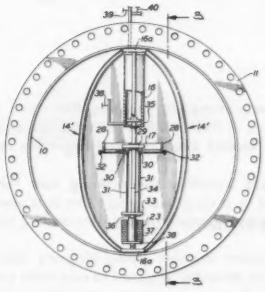
each side of said closure member and extending from outside of the peripheral wall of said orifice and into the open end of the bag for guiding it between the closed and open positions; and means removably attaching the closed end of said bag to the end of the closure member which leads during the closing movement thereof, said bag providing a flexible wall separating said guide means from the interior of said orifice.

3,905,390

SURGE PROTECTION VALVE

Wasyl A. Pysh, Erie, Pa., assignor to Techno Corporation, Erie, Pa.

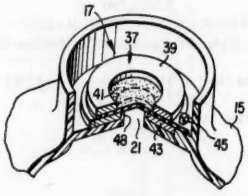
Filed Nov. 5, 1973, Ser. No. 412,781
Int. Cl.² F16K 17/20
U.S. Cl. 137—518 **2 Claims**



1. A valve comprising a hollow, generally cylindrical body, means for connecting said hollow body in a duct adapted to have a gas flowing therethrough,
a hinge rod inside said body extending generally parallel to the diameter thereof and being fixed to said body,
vanes swingably supported on said hinge rod and extending toward an inlet end of said body and outward toward the inner-periphery thereof,
said vanes being adapted to be urged to swing toward the inner-periphery of said hollow body by the flow of gas therethrough from the inlet end.
a cylinder supported in said hollow body forming a substantially closed cylindrical chamber,

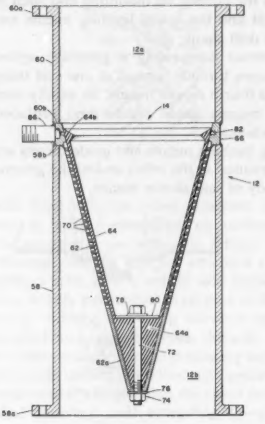
said cylindrical chamber having a piston therein,
a piston rod attached to said piston extending diametrically of said body partially without said cylinder and within said body and generally parallel to said hinge rod,
a pair of transverse rod means supported about said cylinder in said body and parallel to said piston rod,
weight means slidably supported on said transverse rod means,
said piston rod being connected to said weight means through plate attaching means for movement therewith, cable means connected to said vanes and to said attaching means such that movement of said piston rod and weight means in one direction exerts a force on said cable means tending to swing said vanes away from the inner-peripheral surface of said body,
whereby said weight means bias said vanes to an open position and said cylindrical chamber and piston act as a dashpot preventing an excessive rate of closure of the vanes.

3,905,391
MAGNETIC FLAP VALVE
George W. Oakes, South Boston, Va., assignor to Irving Melnick, Danville, Va.
Filed Nov. 19, 1973, Ser. No. 416,872
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—525.3 **7 Claims**



1. A pressure-actuated one-way flap-valve assembly for allowing fluids to flow in a first direction through a valve port but not in a second direction, said flap-valve assembly comprising:
a valve-seat assembly for defining said valve port surrounded by a valve seat, said valve seat assembly including a ferromagnetic cylinder surrounding said valve port; and
a valve-closure member being hingedly attached to said valve-seat assembly adjacent to said valve port so as to be rotatable between a closed position flat against said valve seat and an open position rotated away from said valve seat, said valve closure member comprising a ferromagnetic portion and a flat resilient membrane portion, said ferromagnetic portion and said resilient membrane portion being associated and attached to one another so as to rotate in unison, but with only said resilient membrane portion making contact with said valve seat when said valve closure member is in a closed position, said flat resilient membrane portion having a hinge portion which is attached to said valve seat assembly adjacent to said valve port to allow said valve-closure-member rotation between open and closed positions;
wherein, one of said valve-seat ferromagnetic cylinder and said valve-closure-member ferromagnetic portion is permanently magnetized to cause a magnetic attraction therebetween for urging said flat resilient membrane portion toward said valve seat.

3,905,392
ALARM CHECK VALVE
Robert J. Gray, Raynham, Mass., assignor to Hodgman Manufacturing Co., Inc., Taunton, Mass.
Filed July 29, 1974, Ser. No. 492,509
Int. Cl.[2] F16K *37/00, 15/14, 15/00, 21/04*
U.S. Cl. 137—557 **16 Claims**

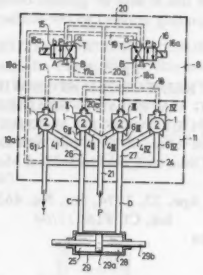


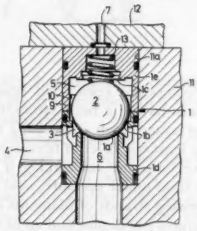
1. An alarm check valve comprising, in combination,
a conduit,
an apertured support member engaged at its periphery to the interior surface of said conduit section, said support member having a curved interior surface facing at least partially in a first direction along the longitudinal axis of the conduit section, and an exterior surface opposite said interior surface,
resilient means mated to the interior surface of said support member and movable off of said interior surface to allow a fluid flow through the valve only in said first direction, and
outlet means in fluid communication between a portion of said interior surface and said alarm, said outlet means being sealed from fluid in the valve adjacent to the exterior surface of said support member.

3,905,393
MULTIPLE-WAY HYDRAULIC VALVE
Manfred Hartwig, Nellingen, Germany, assignor to G. L. Rexroth GmbH, Lohr, Main, Germany
Filed Nov. 27, 1973, Ser. No. 419,156
Claims priority, application Germany, Dec. 1, 1972, 2258853
Int. Cl.[2] F16K *11/087, 11/20*
U.S. Cl. 137—596.14 **6 Claims**

1. A multiple-way valve for hydraulic circuits, comprising a valve body having a valve chamber bounded by a cylindrical surface having a first diameter, and provided with a first port for admitting control fluid into said chamber and surrounded by a first valve seat, a second port axially spaced from said first port and surrounded by a second valve seat, a third valve seat intermediate said first and second valve seats, said first and second ports and said first, second, and third valve seats being substantially coaxial with said cylindrical surface and having diameters smaller than said first diameter, and a third port extending transversely of said chamber and communicating therewith intermediate said second and third valve seats; and a spherical valve member mounted in said chamber for movement with respect thereto between a first position in which said valve member engages said second and third valve seats and interrupts communication between said second and third

ports, and a second position in which said valve member engages said first valve seat and interrupts communication between said first port and said chamber, said valve member having a second diameter smaller than said first diameter and





being mounted in said chamber with clearance from said cylindrical surface as said valve member moves between said positions thereof, so that frictional retardation of the movement of said valve member resulting from contact of the latter with said cylindrical surface is avoided.

3,905,394

FLOW CONTROL SYSTEM

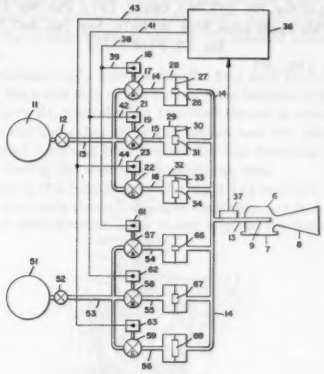
James B. Jerde, Alameda, Calif., assignor to Digital Dynamics, Inc., Sunnyvale, Calif.

Filed Apr. 12, 1974, Ser. No. 460,350

Int. Cl.² F16K *19/00*

U.S. Cl. 137—599 **5 Claims**

1. A flow control system comprising a gas nozzle, a source of gas under predetermined pressure, a first conduit connecting said source and said nozzle, a first flow control valve in said conduit, means including a first restricted orifice in said conduit, said orifice being of a size to produce gas flow therethrough, from said predetermined pressure, at or above sonic velocity whereby to insure a fixed rate of mass flow of said gas under said predetermined pressure, a second conduit connecting said source and said nozzle, a second flow control valve in said conduit, means including a second restricted orifice in said conduit, said second orifice being of a size to produce gas flow therethrough, from said predetermined pressure, at or above sonic velocity whereby to insure a fixed mass flow of said gas under said predetermined pressure, and means for



selectively actuating said first valve and said second valve individually and together.

3,905,395

MIXING CHAMBER

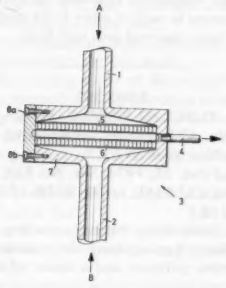
Klaus Peter Hupe, Karlsruhe, Germany, assignor to Hewlett-Packard GmbH, Wurttemberg, Germany

Filed Dec. 19, 1973, Ser. No. 426,417

Claims priority, application Germany, Dec. 28, 1972, 2263769

Int. Cl.² B01F *5/06*

U.S. Cl. 137—604 **4 Claims**



1. An apparatus for mixing two separate streams of liquid flowing under pressure comprising:

two continuous, parallel, pressure-resistant screens, each having an external side and an internal side for forming a mixing chamber between the internal sides of said screens;

a first inlet means coupled to the external side of the one of the screens for entry of a first liquid to be mixed into the chamber through said screen;

a second inlet means coupled to the external side of the other screen for entry of a second liquid to be mixed into the chamber through said screen; and

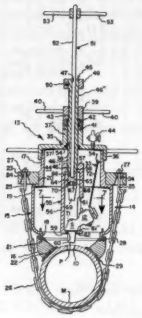
outlet means coupled to the mixing chamber for outflow of the stream of mixed liquid;

said screens being disposed a distance apart approximately equal to at least five times less than the lateral extension of the screens.

3,905,396
APPARATUS FOR MOVING A PLUG FITTING

Ralph L. Peterson, 27 Woodward Dr., West Seneca, N.Y. 14224

Division of Ser. No. 293,763, Oct. 2, 1972, Pat. No. 3,822,718.
This application Mar. 4, 1974, Ser. No. 447,722
Int. Cl. F16l *55/18*
U.S. Cl. 138—97 6 Claims



1. In apparatus for moving a plug fitting relative to a hole in a conduit, the combination comprising:

a housing mountable on said conduit over said hole;

insertion means movably mounted on said housing and including an inner portion disposed within said housing for movement toward and away from said hole; and

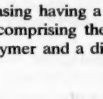
holding means mounted on said inner portion of said insertion means for holding a plug fitting to be inserted in said hole and for selectively releasing said fitting when said insertion means is moved away from said hole after said fitting has been inserted into said hole.

3,905,397
TUBULAR FOOD CASINGS

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

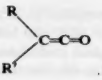
Filed Oct. 15, 1974, Ser. No. 514,731
Int. Cl.[2] F16L *11/00;* B05B *13/06*
U.S. Cl. 138—118.1 17 Claims

1. A tubular food casing having a coating adhered to the inner surface thereof comprising the reaction product of a polyethylene imine polymer and a dimer of a ketene having the formula



where R and R′ are selected from the group consisting of hydrogen and C_4-C_{20} alkyl, aryl and cycloalkyl groups, not more than one of the R and R′ groups being hydrogen, and said coating being present in an amount sufficient to impart peelability of said coated casing from food products processed therein.

9. The method of preparing a tubular food casing that exhibits improved peelability characteristics to meat products encased therein which comprises the steps of coating the inside surface of a tubular food casing with an aqueous coating composition comprising a curable admixture of a polyethylene imine polymer and a dimer of a ketene having the formula

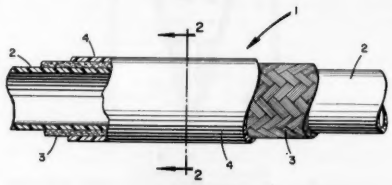


where R and R′ are selected from the group consisting of hydrogen and C_4-C_{26} alkyl, aryl and cycloalkyl groups, not more than one of the R and R′ groups being hydrogen, and then curing the coating applied to the surface of said casing.

3,905,398
COMPOSITE REINFORCED HOSE WHEREIN THE REINFORCING MATERIAL IS BRAIDED AROMATIC POLYAMIDE FILAMENTS

Hans A. Johansen; Larry R. Phillippi, and Edward A. Green, all of Mantua, Ohio, assignors to Samuel Moore & Company, Aurora, Ohio

Filed Apr. 23, 1974, Ser. No. 463,371
Int. Cl. F16l *11/04*
U.S. Cl. 138—124 16 Claims



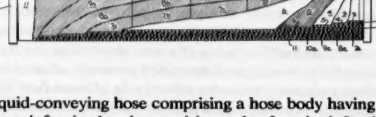
13. A flexible composite reinforced hose for conveying fluids under pressure having a burst strength of greater than 10,000 pounds per square inch comprising a synthetic polymeric core tube, at least one layer of fibrous reinforcing material about the core tube and reinforcing it against bursting while conveying a fluid under pressure, said fibrous reinforcing material comprising strands of filaments having a tenacity of from 12 to 25 grams per denier and an elongation at break of from about 2% to about 7%, said strands being applied about the core tube at a lay of from about 40° to about 60° with the axis of the core tube.

14. The hose of claim 13 wherein the reinforcing material is braided aromatic polyamide filaments having a tenacity of about 20 grams per denier and an elongation of not more than 5%.

3,905,399
LIQUID-CONVEYING HOSE

George Dunnet, Edinburgh, Scotland, assignor to Uniroyal Limited, Midlothian, Scotland

Filed Dec. 21, 1973, Ser. No. 427,385
Claims priority, application United Kingdom, Jan. 2, 1973, 194/73
Int. Cl.[2] F16L *11/08*
U.S. Cl. 138—129 6 Claims



1. Liquid-conveying hose comprising a hose body having at least one reinforcing band comprising a ply of cord reinforcing material having cords extending around said hose body at an angle to the axis of said hose body, said angle being lower at one end of the hose than at the other.

3. A hose in accordance with claim 1 which includes a plurality of reinforcing bands applied to the hose in axial bands extending along the length of the hose, each of said reinforcing bands comprising a ply of cord reinforcing material having cords extending around said hose body at an acute angle to said axis of said hose body, said acute angle of said cords in successive axial bands along the length of the hose increasing from one end of the hose to the other.

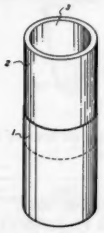
3,905,400
ELECTROFORMING MANDREL

Donald G. DuPree, Alta Loma, Calif.; Raymond E. Bailey, and Chester H. K. Ling, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 89,215, Nov. 13, 1970, abandoned. This application June 23, 1972, Ser. No. 265,918

Int. Cl. F16l *9/14*

U.S. Cl. 138—140 **6 Claims**



5. A cylindrically shaped, hollow, permanent mandrel suitable for surficial electrodeposition of a xerographic belt substrate of nickel comprising;

a hollow core member, a metal sleeve consisting essentially of nickel over said core member which conforms to the dimensions thereof, said sleeve having a chromium coating on at least one surface thereof and a thickness of between about 10 to 60 mils and being mechanically secured to said core member.

3,905,401
METHOD AND APPARATUS FOR WEAVING A ROW OF SLIDE-FASTENER LINKS INTO THE EDGE OF A TAPE

Arthur Steingruebner, Am Buchenhang 11, 53 Bonn 1, Germany

Filed June 6, 1974, Ser. No. 477,313

Claims priority, application Germany, June 6, 1973, 2328677

Int. Cl.[2] D03D *41/00;* **A44B** *19/42*

U.S. Cl. 139—11 **7 Claims**

1. A weaving method for binding a row of slide-fastener links at the edge of a tape during weaving the tape formed of warp threads and two weft threads on a needle loom having warp and weft supply means, two parallel needles and a front reed, said method comprising the steps:

a. dividing the warp threads in a group of ground warp threads and in at least two fastening threads, lying at the edge of the tape;

b. feeding the row of slide-fastener links in a warp direction defined between the ground warp threads and the fastening threads;

c. 1. building up a shed of ground warp threads and of the fastening threads, while the row of slide-fastener links is maintained in the median plane of the shed;

2. simultaneously introducing the two weft threads into the open shed to form two shot loops, wherein one of the weft threads is introduced on one side of the row of slide-fastener links and the other weft thread is introduced on the other side of the row of slide-fastener links and wherein one weft thread is wound around one of the fastening threads and the other weft thread is wound around the other fastening thread;

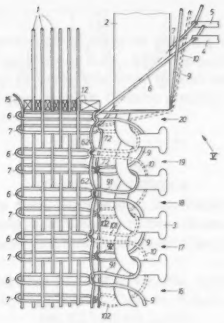
3. closing the shed and beating up;

d. 1. building up a new shed with the ground warp threads and the two fastening threads, while again maintaining the row of slide-fastener links in the median plane of the shed;

2. simultaneously introducing the two weft threads each on the same side of the row of slide-fastener links as at step (*c* 2), whereby the one weft thread is wound now around the other fastening thread and the other weft thread is wound now around the one fastening thread;

3. closing the shed and beating up; and,

e. repeating the sequence of the steps (c) and (d), so that both fastening threads cross at each step (c) and (d) the row of slide-fastener links at the edge of the tape.



7. Apparatus for weaving a row of slide-fastener links into the edge of a tape formed of warp threads and weft threads each from its supply, the said warp threads and in at least a pair of tie-in warp threads, said apparatus comprising:

a needle loom having a front reed;

two parallel weft thread introducing needles, both operating in the same direction on said loom;

a guide bar for guiding a row of slide-fastener links;

said guide bar extending in the direction of the warp threads and ending at that location where the weft threads are beaten up to the woven tape;

the operative position of one of said needles being above said guide bar;

the operative position of the other of said needles being below said guide bar;

said guide bar covering said row of slide-fastener links to bear against the pair of tie-in warp threads which tie-in the links; and,

said guide bar having an end face which acts as a deflecting means for said tie-in warp threads.

3,905,402
ARRANGEMENT FOR DISTRIBUTION OF A PRESSURE MEDIUM IN A JET LOOM

Milos Jansa, Brno; Miloslav Bezdek, Chorvatska Nova Ves, and Juraj Spisiak, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Avodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Filed Jan. 28, 1974, Ser. No. 436,898

Claims priority, application Czechoslovakia, Jan. 26, 1973, 599-73

Int. Cl.[2] D03D *47/30*

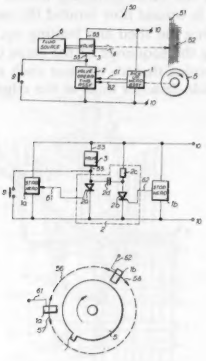
U.S. Cl. 139—127 P **7 Claims**

1. In a jet loom having a shed into which a weft may be propelled by means of the application, through a jet, of a pressure medium supplied from a pressure source, an im-

proved arrangement for selectively applying the pressure medium to the jet, which comprises:

a normally closed valve for interconnecting the pressure source with the jet, the valve being operable to an open condition upon the excitation of a control input thereof;

first normally disabled switching means operable when



enabled for exciting the control input of the valve to open the valve;

an actuator cooperable with the first switching means for enabling the first switching means when the actuator is moved past the first switching means; and

means for cyclically moving the actuator past the first switching means to enable the first switching means.

3,905,403

METHODS OF MANUFACTURING DUAL INTERLOCKED SAFETY SPRING ASSEMBLIES

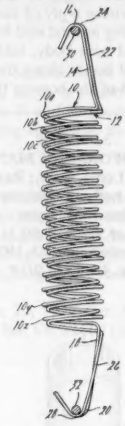
Woodrow Wilson Smith, and David Jack Youngquist, both of Coldwater, Mich., assignors to Kuhlman Corporation, Troy, Mich.

Division of Ser. No. 427,495, Dec. 26, 1973. This application Oct. 29, 1974, Ser. No. 518,251

Int. Cl.² B21F *3/12*

U.S. Cl. 140—71 R **8 Claims**

3. The method of forming a dual safety interlock tension spring having connecting means at each end thereof and connectible between two points in an apparatus to exert tension forces therebetween which comprises the steps of positioning two substantially straight spring wires in substantial parallelism and in preselected positional relationship to each other, advancing an initial length of the wires to establish a straight length, forming the two spring wires starting at a point following the straight wire length concurrently into a substantially single-layer double-wound coil while substantially maintaining said preselected positional relationship between the wires during the coiling, and severing the wires at a point spaced from the completion end of the coil to establish a further



straight length, and forming all four of the straight lengths to a connecting configuration.

3,905,404

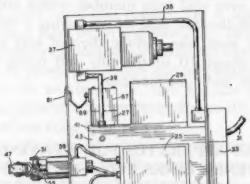
CONTAINER FILLING CONTROL

James R. Cox, 1816 Lawndale Dr., Fort Wayne, Ind. 46805

Filed Jan. 7, 1974, Ser. No. 431,347

Int. Cl.² B65B *31/00, 57/14*

U.S. Cl. 141—46 **12 Claims**



1. In a container processing system wherein a container to be filled and a control unit individual to that container are both moved past a plurality of processing stations including at least a container filling station, an improved fluid logic control unit comprising:

a first fluid valve adapted to be actuated from one of its open and closed conditions to the other by means at the container filling station to indicate arrival of the control unit at that station;

a second fluid valve adapted to be actuated from one of its opened and closed conditions to the other by the presence of a container with its associated control unit for inhibiting the filling operation in the event that no con-

tainer accompanies the control unit at the container filling stations;

a fluid logic circuit having at least one output and inputs coupled at least to said first and second valves, said fluid logic circuit providing an output signal indicating when both the container is present and the container is at the container filling station; and

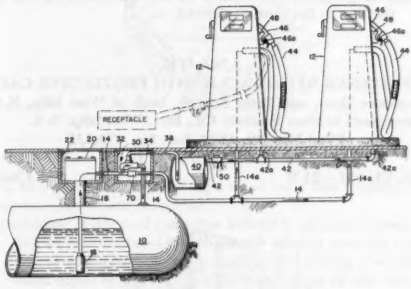
fluid actuable relay means coupled to the fluid logic circuit output for initiating the filling operation when the fluid logic circuit provides an output signal.

3,905,405

GASOLINE DISPENSING AND VAPOR RECOVERY SYSTEM

Kirk Fowler, Bettendorf, and Elmer M. Deters, Muscatine, both of Iowa, assignors to Weil-McLain Company, Inc., Dallas, Tex.

Filed Sept. 25, 1973, Ser. No. 400,555
Int. Cl.² B65B *31/00*
U.S. Cl. 141—46 **8 Claims**



1. A fluid dispensing system comprising storage means for said fluid, first conduit means adapted to connect said storage means to a receptacle, and pumping means for pumping said fluid from said storage means through said first conduit means and to said receptacle, wherein the improvement comprises second conduit means in open communication with said first conduit means and said storage means for continuously diverting a portion of said fluid in said first conduit means back to said storage means, means for forming a reduced pressure zone in said second conduit means in response to flow through said second conduit means, third conduit means connected to said receptacle and to said second conduit means in communication with said reduced pressure zone for drawing the vapors from said receptacle and into said second conduit means for passage into said storage means, and means in said third conduit means responsive to said reduced pressure attaining a predetermined minimum value for terminating said drawing of vapors.

3,905,406

BAG SUPPORT STAND

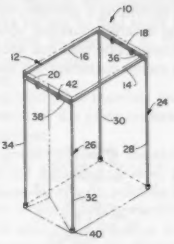
Brentwood A. Cruse, 5283 Bardwell Ave., Riverside, Calif. 92506

Filed Apr. 17, 1974, Ser. No. 461,495
Int. Cl.² B65B *1/04*
U.S. Cl. 141—390 **10 Claims**

1. A stand for supporting a flexible walled container in an open position comprising:

an upper base section formed of a narrow element formed in substantially a rectangular configuration having longitudinal sides interconnected together by end elements;

a first U-shaped leg assembly having a pair of substantially parallel legs interconnected together by a first apex element, a second U-shaped leg assembly having a pair of substantially parallel legs interconnected together by a second apex element, said first apex element connected by connecting means to one of said ends, said second apex element connected by said connecting means to the other of said ends, said connecting means permitting



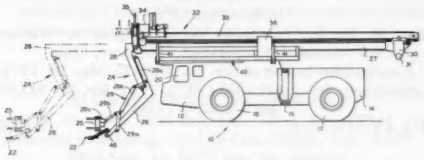
pivotal movement of each of said leg assemblies with respect to said upper base, whereby said leg assemblies are capable of being pivotably moved and located adjacent said upper base to thereby position said stand in a collapsed position.

3,905,407

TREE HARVESTER

Douglas Stanley Guy, St. Thomas; Ian McKenzie, Lambeth, both of Canada, and Charles Robert Sturtz, Jr., Romulus, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed May 25, 1973, Ser. No. 363,936
Claims priority, application Canada, Feb. 6, 1973, 163290
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D **16 Claims**



1. A tree harvester comprising a mobile frame carrying tree processing means to sever a standing tree, fell the tree backward over the harvester and remove limbs therefrom, said tree processing means comprising an elongated member mounted on the frame, a second elongated member mounted on the frame for reciprocation relative to the first, a trunnion mounting for both members on which they swivel together, tree severing means mounted on the second elongated member, limb removal means operable longitudinally on the first elongated member to remove limbs from a tree, tree transfer means mounted on the second elongated member for pivoting a severed tree backward over the machine into a position lengthwise of the first elongated member and clamp means on the first elongated member for holding the severed tree stationary.

3,905,408

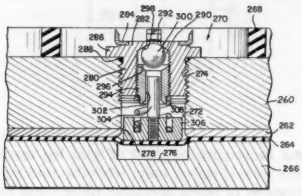
VACUUM FLITCH TABLE FOR VENEER SLICER

Thomas F. Hale, New Albany, Ind., assignor to Capital Machine Company, Inc., Indianapolis, Ind.

Filed Mar. 29, 1974, Ser. No. 456,054
Int. Cl.² B27L *5/06;* **B25B** *11/00*
U.S. Cl. 144—178 **30 Claims**

1. A veneer slicer comprising a reciprocable flitch table, a knife and pressure bar assembly movable toward and away from the path of reciprocation of said flitch table, and means for reciprocating said flitch table, in which the improvement

comprises vacuum means for holding flitches to said table, said vacuum means including a vacuum source, at least one vacuum cell plate mounted on said flitch table for movement therewith, said cell plate providing a front surface facing said knife and pressure bar assembly and against which a flitch is held, said cell plate providing a plurality of cell areas in said front surface, sealing means extending about each cell area, conduit means for connecting said cell areas to said vacuum source, said conduit means including, for each cell area, valve



means, each said valve means including means for determining when its associated cell area is completely covered by a flitch and opening said cell area to said vacuum source only when it is completely covered by a flitch, said determining means including actuating means for opening said valve means to air flow from said cell area to said vacuum source, the air flow from said cell area being sufficient to close said valve means when said cell area is not completely covered and insufficient to close said valve means when said cell area is completely covered.

3,905,409

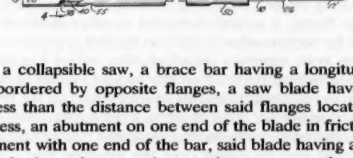
COLLAPSIBLE SAW

Earl H. Bradley, Seekonk, Mass., assignor to Worcester Pressed Aluminum Corporation, Worcester, Mass.

Continuation-in-part of Ser. No. 471,232, May 20, 1974, abandoned. This application Oct. 3, 1974, Ser. No. 511,540

Int. Cl. B27b *21/00*

U.S. Cl. 145—33 E **14 Claims**



1. In a collapsible saw, a brace bar having a longitudinal recess bordered by opposite flanges, a saw blade having a width less than the distance between said flanges located in said recess, an abutment on one end of the blade in frictional engagement with one end of the bar, said blade having at the other end a brace bar-engaging member to engage the other end of the brace bar, resilient means acting between the end of the brace bar and said member and carried by one of them so as to hold the saw blade under tension in the recess of said brace bar.

3,905,410

OIL TRANSPORTING DEVICE

George Arato, Toronto, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 5, 1974, Ser. No. 448,339

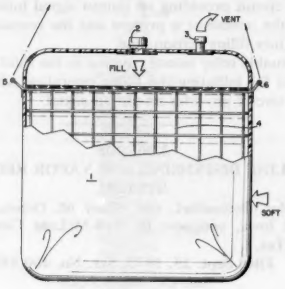
Int. Cl.² B65D *25/34*

U.S. Cl. 150—1 **1 Claim**

1. A substance transporting device, comprising

a soft plastic bag having a filling snout and a ventilating valve;

a steel wire net in the bag for reinforcing the bag; and



handling lugs affixed to the wire net and extending through the bag to the outside thereof.

3,905,411

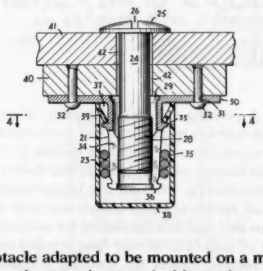
FASTENER RECEPTACLE WITH PROTECTIVE CAP

Theodore Dzus, and Peter Schenk, both of West Islip, N.Y., assignors to Dzus Fasterer Co., Inc., West Islip, N.Y.

Filed May 29, 1974, Ser. No. 474,235

Int. Cl.² F16B *37/14, 39/28*

U.S. Cl. 151—21 R **5 Claims**



1. A receptacle adapted to be mounted on a member to be fastened to receive a stud engaged with another member so as to fasten the two members together comprising:

an elongated hollow body portion open at both ends and having securing means on the inner surface thereof for engagement with a stud;

a flange extending laterally from one end of the body for mounting the receptacle to one member;

the body having weakened zones in the area of the securing means and being surrounded by a compression spring tending to compress the body with the assistance of the weakened zones;

a protective cap of resilient material surrounding at least a substantial portion of the body and interengaged with the body, the cap having a closed end in position to capture debris displaced from the receptacle or a stud interengaged therewith when two members are fastened together;

an annular rib extending laterally from the exterior surface of the body intermediate the ends thereof;

the cap having resilient tabs normally extending downwardly and inwardly with respect to the closed end thereof so that positioning of the cap about the body will result in the tabs being deformed so as to pass over the rib and return to their initial configuration, the bottom free edges of the tabs being engaged with the upper surface of the annular rib to retain the cap on the body of the receptacle; and

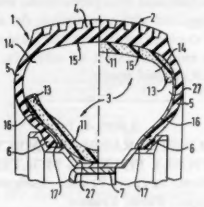
the protective cap surrounding and capturing the compression spring as well as the substantial portion of the body of the receptacle, the upper edge of the protective cap being positioned substantially in interengagement with the undersurface of the flange of the body of the receptacle.

3,905,412

SAFETY TIRE HAVING AUTOMATIC INFLATING MEANS IN THE EVENT OF TEARS OR PUNCTURES

Sergio Marocco, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed July 25, 1973, Ser. No. 382,364
Claims priority, application Italy, Aug. 4, 1972, 27895/72
Int. Cl.[2] B60C *17/02*
U.S. Cl. 152—340 **17 Claims**



1. In a pneumatic tire having a tread band and a casing, the improvement which comprises

providing inside said casing an inflatable structure comprising an annular band of deformable sealing material capable of sealing a hole in the casing and having a width at least equal to the width of the tread band of said tire,

wherein said annular band is situated in a first position out of contact with the inner surface of the casing when the tire is in working condition and

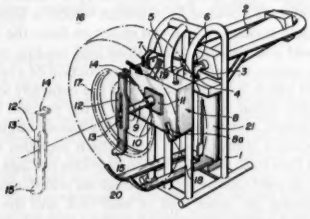
means for inflating said structure to displace said annular band to a second position in contact with the inner surface and below the tread band, said means comprising a bottle for compressed air or gas mounted eccentrically on the rim to which the tire is fitted allowing for generation of a centrifugal force upon the rim when the compressed air or gas flows from said bottle to indicate the occurrence of a puncture or a tear in the tire.

3,905,413

TUBELESS TIRE CHANGER

Clifford C. Myers, R.R. No. 1, Milan, Ill. 61264

Filed Aug. 30, 1973, Ser. No. 393,071
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.24 **2 Claims**



1. In an apparatus for breaking a bead between a tire and a rim, said apparatus including a frame, reciprocating power means for breaking said bead, an apparatus for mounting and demounting said tire and including a tire iron having first and second opposed end portions, the improvement comprising:

a horizontally extending shaft;

means mounting said shaft to said frame for rotational movement of the shaft;

means, including flexible interconnecting means, connecting said power means to said shaft for rotational movement of the shaft in response to the movement of the reciprocal power means;

a plate member;

means mounting said plate member on said frame for rotational movement of the plate member;

an adjusting member;

means mounting said adjusting member on said frame for movement of the adjusting member in a first direction in which said plate member is rotated in one direction and for movement of the adjusting member in a second direction in which said plate member is rotated in another direction opposite of said one direction;

rim clamping means including a plurality of elongated arm members each having first and second opposed end portions;

means mounting said first end portion of each of said arm members to said plate member for simultaneous extension of the arm members in response to said rotational movement of said plate member in said one direction and for simultaneous retraction of the arm members in response to said rotational movement of said plate member in said other direction opposite of said one direction;

means for positioning said tire and rim in an upright position adjacent said rim clamping means;

gripping means on said second end portion of each of said arm members for locking said tire rim in said upright position upon the retraction of said arm members; and

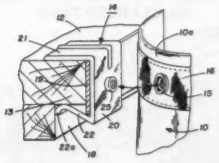
means removably mounting said tire iron to said shaft for rotational movement of the tire iron in response to said rotational movement of said shaft in which said first end portion of said tire iron is used to demount said tire from said rim and in which said second end portion of said tire iron is used to mount said tire to said rim.

3,905,414

DRAPERY CONNECTOR ASSEMBLY

Gerald E. Guebert, 3039 Eric Ln., Dallas, Tex. 75234, and Raymond R. Belknap, 1402 Hi-Line, Dallas, Tex. 75207

Filed Sept. 10, 1973, Ser. No. 395,618
Int. Cl.[2] A47H *1/00*
U.S. Cl. 160—330 **4 Claims**



1. An assembly for draping a table, stage, or the like of the type having a peripheral edge and a recessed apron, said assembly comprising:

a. a plurality of clips resiliently and slidably clamped onto and along said peripheral edge, each of said clips comprising a face portion with a first fastener means disposed at the outer surface of said face portion, and upper and lower leg portions transversely intersecting said face portion, said lower leg portion having its end terminating in a curvilinear portion;

b. each of the said clips clamping said peripheral edge in a manner whereby the inner surface of the upper leg portion and the inner surface of the face portion is against the top and front surfaces, respectively, of the peripheral

edge and the said curvilinear portion simultaneously abuts against the recessed apron and the underside surface of the peripheral edge; and

c. drapery means having a plurality of second fastener means for detachable coupling with respective ones of said first fastener means of said clips.

3,905,415

METHOD OF CASTING PARTS OF HIGH MELTING POINT METAL IN MOLDS

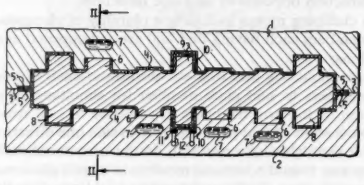
Jean Henri Lefebvre, Chaville, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 12, 1974, Ser. No. 441,744

Claims priority, application France, Feb. 13, 1973, 73.05064

Int. Cl.² B22D *27/04*

U.S. Cl. 164—72 **10 Claims**



1. A method of casting parts from metals having high melting points in molds, comprising the steps of:

prefabricating a form of a pasteboard material and containing a refractory substance in the shape of the cavity of each of the dies of the mold;

perforating at least one of said prefabricated pasteboard forms to produce at least one zone wherein more rapid cooling may take place;

placing each of said prefabricated pasteboard forms in the respective cavities of said dies of said mold;

closing said dies of said mold to secure said pasteboard forms therein; and

filling the pasteboard covered cavities of said dies with a high melting point metal to cast said part.

3,905,416

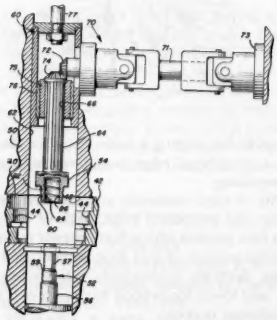
METHOD AND APPARATUS FOR FABRICATING MOLDED ARTICLES

Hieme C. Hammer, 6N - 130 - Rt. 53, Itasca, Ill. 60143

Filed May 21, 1974, Ser. No. 471,862

Int. Cl.² B22D *29/04*

U.S. Cl. 164—132 **14 Claims**



1. A method of fabricating a molded article having an annular space defined by two generally cylindrical side walls with at least one of said side walls having a helically threaded surface, which comprises: producing a generally cylindrical mold space with a two-piece mold; positioning a generally cylindrical, hollow core member within said mold space concentric with the cylindrical space defined by said two-piece mold member, said hollow core member having at least one helically grooved wall with the helical groove having a given direction of advance; positioning a support member in supporting relation with respect to said hollow core member to hold said hollow core member in position in said space; positioning a solid core member within said hollow core member and concentrically therewith; pouring molten metal in the space defined between said mold members; cooling said poured metal; moving said support member away from said solid core member when the metal has cooled to a temperature sufficiently low to produce a solid molded article; simultaneously with the movement of said support member, rotating said hollow core member in the direction opposite to said direction of advance of said helical groove in the wall of said hollow member while said two-piece mold member holds said molded article against either angular or axial movement; separating said two-piece mold member; and moving said solid core member in said direction of advance to remove said molded article out of said space.

3,905,417

ELECTROMAGNETIC RABBLING MECHANISM FOR CONTINUOUSLY POURING MOLTEN METAL

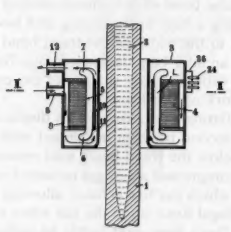
Jean Delassus, Montmorency, France, assignor to Compagnie Electro-Mecanique, Paris, France

Filed Dec. 6, 1973, Ser. No. 422,128

Claims priority, application France, Dec. 21, 1972, 72.45725

Int. Cl.² B22D *11/12, 27/02*

U.S. Cl. 164—147 **8 Claims**



1. A liquid-cooled electromagnetic rabbling mechanism associated with a continuously poured and descending column of molten metal forming an ingot which comprises an annular cooling tank adapted to co-axially surround the descending column of metal, an annular laminated magnetic structure located co-axially within said cooling tank and having a cylindric array of axially extending coil-receiving slots located at the inner periphery thereof, an inductor coil located in said slots, said inductor coil being constituted by a winding of an electrical conductor covered by a sheath which is impermeable to the liquid coolant, a lead-out structure from the terminal ends of said coil through the wall of said cooling tank to an energizing source thereby enabling production of a rotating magnetic field which induces rotation of the centrally located and still molten metal within the outer crust portion of the ingot being formed, and means for effecting forced circulation of a liquid coolant through said tank which includes means establishing a flow path therefor which provides passage of the coolant from an inlet downwardly through an annular passage provided between the outer wall of said tank and the outer periphery of said annular magnetic structure to the bottom of the coil, thence inwardly to the inner periphery of said annular magnetic structure, thence upwardly through said slots and an annular passage provided between the inner periphery of said annular magnetic structure and the inner wall of said tank to

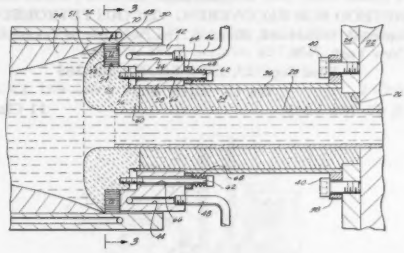
the top of the coil, and thence outwardly from said tank through a discharge outlet.

3,905,418

CONTINUOUS CASTING APPARATUS WITH RESILIENT GRAPHITIC SEALING ELEMENT

Leonard Watts, Cedarhurst, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Nov. 26, 1973, Ser. No. 419,027
Int. Cl.[2] B22D *11/02*
U.S. Cl. 164—260 11 Claims



1. Apparatus for the continuous casting of a metal article comprising, in combination:

a cooled axial mold wall having a forward exit for the article and movable on its axis and defining at least in part a mold cavity;

a wall structure extending transversely of said axial wall and located therein and which is exposed to molten metal in a casting operation, said transverse wall comprising a cooled peripheral portion having a face toward said exit extending transversely of said axial wall;

means to oscillate said axial wall with reference to said transverse wall; and

a solid dynamic sealing element of resilient graphitic material carried by said transverse wall and extending thereabout forwardly of and in contact with said cooled face to be cooled thereby, said sealing element being in internal sealing contact with said axial wall; and

said transverse wall having a forward refractory cover element thereon exposed to molten metal in said mold cavity, said cover element substantially overlapping the foremost portion of said sealing element for thermal insulation of it.

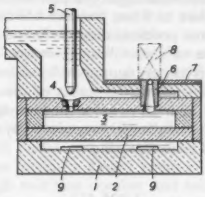
3,905,419

DEVICE FOR RISE CASTING INTO A MOLD

Oskar Tenner, Rossatz, Austria, assignor to Gravicast Patentverwertungsge-Gesellschaft mbH, Vienna, Austria

Continuation of Ser. No. 184,491, Sept. 28, 1971, abandoned.
This application Mar. 29, 1974, Ser. No. 456,154
Claims priority, application Austria, Sept. 29, 1970, 8781/70
Int. Cl.[2] B22D *27/10, 37/00*
U.S. Cl. 164—337 5 Claims

1. A device for rise casting by means of ferrostatic pressure into a mold, comprising: an upwardly extending casting nozzle adjacent the ingate of the mold and having a discharge aperture aligned with an inlet of said ingate, shutoff means including a slidable plate having a bottom surface, for interrupting the still liquid melt between said discharge aperture and said inlet; means arranged at a distance ahead of said nozzle for controlling the casting speed; means for slidably supporting said plate in a bottom wall of the mold; a surface layer of said plate facing and contacting said nozzle in the casting position of the mold and in the shut-off position of said plate consisting of a refractory material; a surface layer of said plate facing and contacting said ingate in the shut-off position of said plate consisting of a material having a higher thermal conductivity than that of the refractory material; and feeder means in the



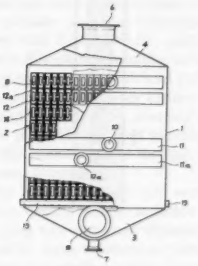
mold above said ingate and in communication with the interior of the mold.

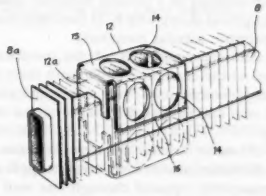
3,905,420

DESUBLIMER FOR THE RECOVERY OF SUBLIMED PRODUCTS, PARTICULARLY PHTALIC ANHYDRIDE, FROM REACTION GASES

Friedrich Wirth, Ludwigshafen; Gert Buerger, Mannheim; Joachim Wagner, Ludwigshafen; Eberhard Schoenberger, Frankenthal; Harry Kassat, Bochum, and Herbert Kolenda, Herbede, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 7, 1974, Ser. No. 449,029
Claims priority, application Germany, Mar. 10, 1973, 2312088
Int. Cl. F28g *9/00*
U.S. Cl. 165—82 10 Claims





1. A desublimer for the recovery of sublimed products, anhydride, from reaction gases, consisting essentially of a closed housing for the accommodation or passage of the reaction gas and a plurality of substantially horizontally mounted rows of finned tubes adapted for the passage of heating or cooling media therethrough alternately, the reaction gas being caused to flow through the housing transversely to the flow of heating or cooling medium in the tubes, the superposed finned tubes being paired off by means of 180° bends interconnecting two superposed tubes at one end thereof, the other ends being provided with connections for the inlet and outlet of the heating or cooling medium giving an alternate arrangement of said connections and 180° bends in the vertical direction, and in

which the superposed tubes or rows of tubes are mounted at a distance from each other with a restricted freedom of movement to allow for differences in thermal expansion or contraction, wherein sliders with cage-type perforations are mounted on the finned tubes to form box-like elements thereabout, disposed in the same positions on each finned tube and at least in the end regions of said tubes, by means of which sliders each finned tube is loosely supported by at least the vertically adjacent slider beneath it, the stacks of directly superposed sliders associated with all rows of tubes or all rows of tubes within each group being loosely supported by common girders securely attached to the housing.

3,905,421
WELL GRAVELLING TOOL

Glen L. Jordan, Houma, La., assignor to Ernest R. Jordan; Jack D. McCartney, Jr. and James C. McGueyer, all of Houma, La.

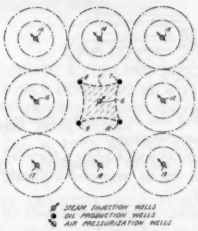
Filed Apr. 15, 1974, Ser. No. 460,750
Int. Cl.² E21B *43/04*
U.S. Cl. 166—51 **10 Claims**

1. Apparatus characterized as a well gravelling tool for operative attachment to the terminal end of a drill pipe string for use, with production tubing, in the conveyance, positioning and gravel packing of a tubular member within a well via use of a water-gravel slurry which, in combination, comprises:
a pair of concentric tubular members,
a large diameter single wall tubular member with means located at the enclosing upper wall thereof for operative engagement and open communication with the lower wall end of a pipe at the terminus of a drill pipe string.
a small diameter tubular member mounted within said large diameter tubular member, the upper end of which is permanently opened through the wall of the large diameter tubular member to the exterior and closed to the opening through the large diameter tubular member,
a fixed elastic seal of tubular shape externally fitted upon the large diameter single wall member for tight engagement with the production tubing within which the apparatus is conveyed,
means located on the lower extremity of said small diameter tubular member for operative engagement with the upper end of the tubular member positioned in the well,
whereby the apparatus can be conveyed via the production tubing into the well, a water-gravel slurry can be passed downwardly from the surface through the drill pipe string, through the large diameter tubular member, and the annulus between the pair of concentric members constituting the well gravelling tool, and gravel dispersed and packed under pressure about the annulus of the tubular member positioned in the well, water passed through the packing into the positioned tubular member and upwardly through the opening of the small diameter tubular member, and into an annulus formed by the outer wall of the pipes constituting the drill pipe string where it ascends to the surface, the apparatus detached from the tubular member now in place, and the drill pipe string and apparatus returned without any necessity of withdrawing the production tubing.

3,905,422
METHOD FOR RECOVERING VISCOUS PETROLEUM

Charles D. Woodward, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,385
Int. Cl.² E21B *43/24*
U.S. Cl. 166—245 **11 Claims**



1. In a method of recovering petroleum from a subterranean petroleum containing formation penetrated by at least one injection well and by at least one production well, of the type wherein thermal recovery fluid is introduced into the injection well and petroleum is recovered from the remotely located production well, wherein the improvement for increasing the capture efficiency of the oil recovery operation and for pretreating a portion of the formation for the next phase of the oil recovery method comprises:
a. completing at least one gas pressurization well in the formation on the opposite side of the production well from the thermal recovery fluid injection well,
b. introducing a gaseous material into the pressurization well at a pressure less than the pressure at which the thermal recovery fluid is introduced into the injection well for the purpose of pretreating the formation petroleum and creating a pressure gradient around the additional well which serves to confine the injected fluid in mobilized petroleum, and
c. recovering petroleum from the production well.

3,905,423
METHOD OF PROTECTING WELL APPARATUS AGAINST CONTAMINATION DURING HANDLING

Derry D. Sparlin, and Clarence B. Kolb, Jr., both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed May 1, 1974, Ser. No. 465,977
Int. Cl.² E21B *43/10*
U.S. Cl. 166—296 **5 Claims**

1. A method of placing a cavitycontaining well apparatus downhole in a wellbore comprising:
a. blending together from 25 to 80 parts by weight of a paraffin wax heated to a temperature above its melting point and from 75 to 20 parts by weight of a polymer selected from the class consisting of polyterpenes, polyvinyl acetates, polyolefins, polyamides and rosin esters to

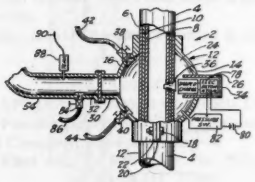
form a melted wax-polymer blend having a softening point 10-15°F below its melting point,
b. filling the cavity of the well apparatus with the melted wax-polymer blend,
c. solidifying the wax-polymer blend,
d. positioning the so-treated well apparatus downhole in a wellbore, and
e. removing the wax-polymer blend from the cavity.

3,905,424

CRYOGENIC CONTROL VALVE

Albert A. Elwood, 301 Broadway, Riviera Beach, Fla. 33404, and James Patterson, 2195 Ibis Isle Rd., Palm Beach, Fla. 33480

Division of Ser. No. 168,331, Nov. 26, 1971. This application Jan. 28, 1974, Ser. No. 437,067
Int. Cl. A62c *3/00*
U.S. Cl. 169—46 **2 Claims**



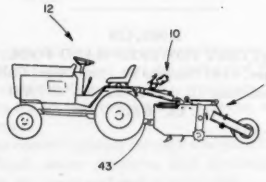
1. A method of controlling fires comprising the steps of:
a. securing a body member to a conduit supporting the fire,
b. transferring inert liquid cryogenic material into said body member
c. actuating a quick opening means to open a passageway from said body member into said conduit, and
d. supplying said cryogenic material to starve the fire of oxygen and to lower the temperature of the conduit fluid moving toward the fire.

3,905,425

HYDRAULIC STABILIZER FOR LIMITING MOVEMENT

Carl D. Jackson, 712 W. Broadway, Fortville, Ind. 46040

Filed Dec. 26, 1972, Ser. No. 318,384
Int. Cl.² A01B *63/02*
U.S. Cl. 172—321 **2 Claims**



1. A hydraulic stabilizer for limiting movement between a first vehicle and a second vehicle attached thereto comprising:
a cylinder mounted to said first vehicle having an inner surface defining a piston receiving cavity with liquid therein, opposite ends and a first outlet at one of said ends and a second outlet at the other of said ends;
a piston slidably mounted in said cavity between said first outlet and said second outlet and in sealing engagement with said inner surface preventing liquid flow past said piston;
a piston rod fixedly attached to said piston, said rod extends through said cavity and has a distal end extending outwardly from said cylinder and connected to said second vehicle;
a first conduit and a second conduit connected respectively to said first outlet and said second outlet;
valve means connected to said first conduit and said second conduit and having an open position allowing liquid flow through said first conduit and into said cylinder via said first outlet and allowing said piston to move toward said second outlet causing said liquid flow from said cylinder via said second outlet through said valve means, and with said piston moving toward said first outlet allowing liquid flow through said second conduit and into said cylinder via said second outlet with liquid flow from said cylinder via said first outlet and through said first conduit, said valve means having a closed position preventing liquid flow through said first conduit and said second conduit and preventing motion between said piston and cylinder;
a container holding liquid and being connected to said first conduit and said second conduit and wherein:
said valve means includes a first valve and a second valve connected respectively to said first conduit and said second conduit, each having an open position allowing liquid flow from said container through said first conduit and into said cylinder via said first outlet and allowing said piston to move toward said second outlet causing said liquid flow from said cylinder via said second outlet through said second valve to said container, and with said piston moving toward said first outlet allowing liquid flow from said container through said second conduit and into said cylinder via said second outlet with liquid flow from said cylinder via said first outlet and through said first conduit to said container, said first valve and said second valve having a closed position preventing liquid flow through said first conduit and said second conduit and preventing motion between said piston and cylinder;
said container includes an inner cylindrical side wall defining a chamber with liquid therein, said container further includes a movable plate extending across said chamber and in sealing engagement with said cylindrical side wall of said container, said container further includes a spring mounted therein which is in abutting relationship with said movable plate biasing said movable plate to force liquid from said container and through said first conduit and said second conduit;
said first vehicle is a tractor and said second vehicle is an earth working device which includes a frame with a ground engaging tool mounted thereon, said tractor includes hydraulic means mounted thereon operable to raise and lower said earth working device when said first valve and said second valve are in said open position and with said earth working device locked in position with respect to said tractor when said first valve and said second valve are in said closed position.

3,905,426

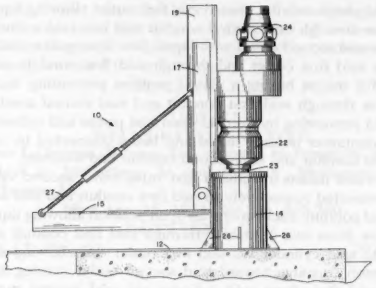
EARTH BORING MACHINE POSITIONING SYSTEM

Raymond Leroy Williams, and Ross Weldon Walker, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed June 28, 1974, Ser. No. 484,046
Int. Cl.² E21B *7/02;* **E21C** *29/00, 5/00*
U.S. Cl. 173—1 **3 Claims**

1. A method of moving an earth boring machine from an initial position on a floor to a desired position on the floor, said earth boring machine having a drive spindle, a thrust system and a base, comprising the steps of:
placing a rotation pedestal beneath the drive spindle of the earth boring machine when the earth boring machine is in said initial position;
connecting the drive spindle of the earth boring machine to the rotation pedestal;
actuating said thrust system thereby positioning said base above the floor;

applying a rotational force to said earth boring machine thereby rotating the earth boring machine on the rotation pedestal; and



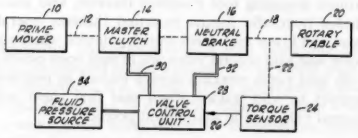
actuating said thrust system thereby lowering said base until said earth boring machine is in the desired position.

3,905,427

SAFETY VALVE APPARATUS FOR ROTARY DRILLING EQUIPMENT

Lindel D. Kenney, 53 Tropicana Ave., Odessa, Tex. 79762

Filed Sept. 20, 1974, Ser. No. 507,928
Int. Cl.² E21B *3/06*
U.S. Cl. 173—12 **6 Claims**



1. A control device for automated control of fluid pressure actuated master clutch and neutral brake which transmit primary power for operation of a well drilling rotary table, comprising:

first valve means actuated to port fluid pressure from said brake to a first output fluid line;

second valve means actuated to port fluid pressure from an input fluid line to said clutch;

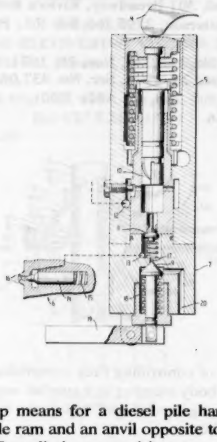
three-way valve means actuated to port fluid pressure from a fluid pressure source to a second output fluid line; and four-way valve means normally connecting said second output fluid line to said input fluid line to said second valve means while connecting said first output fluid line to a pressure exhaust line, said four-way valve means being actuatable to alternate porting connections whereby said input fluid line is connected to said pressure exhaust line to release the master clutch and said second output fluid is connected to said first output fluid line through said first valve means to actuate the neutral brake.

3,905,428

FUEL STOP MEANS FOR A DIESEL PILE HAMMER

Shojiro Nishimura, Ashiya, and Masanori Yonehara, Kobe, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Apr. 26, 1974, Ser. No. 464,320
Claims priority, application Japan, Apr. 27, 1973, 48-48213; May 7, 1973, 48-53771
Int. Cl.² E02D *7/12*
U.S. Cl. 173—128 **3 Claims**



2. A fuel stop means for a diesel pile hammer having a vertically slidable ram and an anvil opposite to the ram at the lower portion of a cylinder, comprising:

a fuel pump driven by a cam mechanism making contact with said ram,

an injection valve for injecting fuel delivered from said fuel pump into said cylinder, and

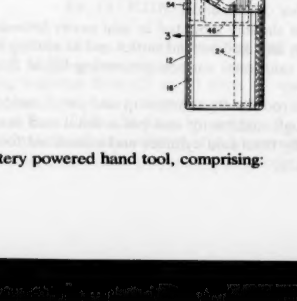
a manually operated valve provided in a fuel conduit for directing fuel from said fuel pump for discharging fuel therefrom, wherein said manually operated valve comprises a discharge port in communication with said fuel conduit and arranged in parallel with said valve body of said fuel pump, a valve body for blocking said fuel conduit from the inside, and a lever for thrusting said valve into said fuel conduit against the internal pressure therein.

3,905,429

BATTERY POWERED HAND TOOL

Alfred H. Berger, 4143 Nemaha Dr., San Diego, Calif. 92117

Filed June 10, 1974, Ser. No. 477,691
Int. Cl.² E21C *1/00*
U.S. Cl. 173—163 **3 Claims**



1. A battery powered hand tool, comprising:

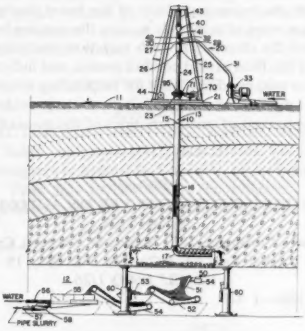
an elongated housing for containing a battery pack therein; said housing having an extension at one end;
a worm gear drive unit mounted in said extension and having an output shaft projecting substantially perpendicular to said housing, with means on the output shaft for attachment thereto of accessory tool bits;
a platform in said extension on which said drive unit is mounted, the platform having a wall portion extending into and secured to said housing;
a bracket fixed on said platform, said output shaft being journalled in said bracket and having bearing means holding the output shaft against axial movement in the bracket;
said drive unit including a worm gear fixed on said output shaft, and a worm mounted in said bracket in mesh with the worm gear;
a drive motor mounted on said platform and having a drive shaft on which said worm is fixed;
said bracket having arms in which said drive shaft is journalled and between which said worm is held against axial movement;
and a motor actuating switch mounted in said housing.

3,905,430

APPARATUS FOR RAISE DRILLING

William N. Poundstone, Pittsburgh, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Aug. 29, 1973, Ser. No. 392,602
Int. Cl.[2] E21C *23/00*
U.S. Cl. 175—53 **1 Claim**



1. An apparatus for forming large diameter shafts between the roof of a mine tunnel and the surface of the earth having rock and material therebetween comprising:
a. means for forming a pilot hole between said surface and said roof;
b. means communicating through said pilot hole for conveying fluids under pressure, said communication means having an upper end and a lower end;
c. pump means having an inlet and an outlet, means for securing said pump means rigidly to said communicating means, swivel joint means having an inlet and an outlet, means for connecting the outlet of said swivel joint means to the inlet of said pump means, and means for connecting the inlet of said swivel joint means to a source of fluid;
d. a jet mounting pipe attached to the lower end of said communication means, said jet mounting pipe having fluid communication with said communication means;
e. a plurality of jets attached to said jet mounting pipe, said plurality of jets adapted to direct said fluid under high pressure against the exposed surface of said rock and material above said mine roof, thereby dislodging same;
f. means for rotating said communication means and said jet mounting pipe; and
g. means for raising said communication means, pump means, and said jet mounting pipe as said rock and material are dislodged by said jets.

3,905,431

EARTH BORING METHOD AND APPARATUS

Florian Hasewend, Kapfenberg, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria

Filed Oct. 1, 1973, Ser. No. 402,200
Claims priority, application Austria, Oct. 2, 1972, 8425/72
Int. Cl.[2] E21c *23/00*
U.S. Cl. 175—53 **5 Claims**

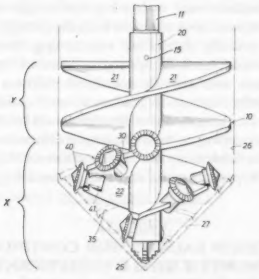
1. A process for boring holes of relatively large diameter through a dam or the like in rocky terrain, comprising the steps of first boring through the dam in a substantially horizontal direction with a first leading borehead by rotating said first borehead while simultaneously pushing it forwardly under a rapidly repetitive horizontal impact, then replacing the first borehead by a second drilling borehead having a larger diameter than the first borehead and then boring in the opposite direction through the first borehole with the second borehead by rotating said second borehead while simultaneously pushing it rearwardly under a rapidly repetitive horizontal impact, whereby the first borehole is enlarged.

3,905,432

AUGER WITH ROTATABLE CUTTERS

John M. Mullins, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed July 12, 1971, Ser. No. 161,453
Int. Cl.[2] E21B *9/24;* **E21C** *13/04*
U.S. Cl. 175—335 **6 Claims**

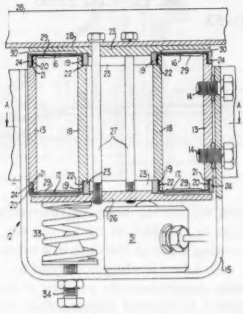


1. In an earth boring auger, the improvement comprising the combination of:
auger means for collecting and retaining cuttings from a bore hole bottom;
tapered auger flight means diverging generally outwardly and upwardly from a leading end of the auger means;
cylindrical auger flight means connected with said tapered auger flight means; and
a plurality of rotatable earth disintegrating elements spaced along a portion of at least the tapered auger flight means.

3,905,433
WEIGH DEVICES

Stephen Henry Raynes, Aylesbury, England, assignor to Arthur Guinness Son and Company (Park Royal) Limited, London, England

Division of Ser. No. 366,112, June 1, 1973, Pat. No. 3,863,725.
This application Sept. 12, 1974, Ser. No. 505,229
Claims priority, application United Kingdom, Jan. 24, 1972, 3187/72
Int. Cl.² G01G 21/10
U.S. Cl. 177—184 13 Claims



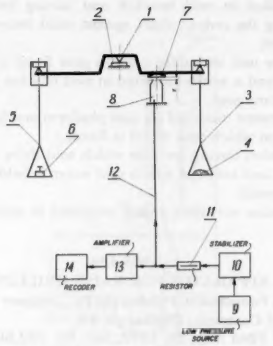
1. A weigh device comprising at least two substantially parallel diaphragms secured in overlying and vertically spaced relationship by rigid tubular support means, the diaphragms being substantially rigid in the planes of their extent and having a degree of flexibility in a direction normal to such planes; rigid coupling means located within the confines of said tubular support means, said coupling means extending axially between and being secured to the diaphragms at positions remote from the support means and substantially centrally thereof; a substantially horizontal platform rigidly secured relative to one of said means and in substantially vertical alignment with that said means, said platform being intended to receive an article to be weighed; a measuring device responsive to relative vertical displacement of, or relative vertical loading on, the one said means relative to the other said means as a result of an article being supported on the platform from which displacement or loading the weight of the article may be determined; and wherein said diaphragms each have an array of radially extending reinforcing means thereon which are circumferentially spaced relative to the axis of the coupling means and provide localized stiffness in the diaphragms radially relative to said axis, each said reinforcing means having an elongated configuration and being located on its respective diaphragm with the larger dimension lying radially relative to said axis over the portion of the diaphragm between said support means and said connecting means.

3,905,434
PRECISION BALANCE FOR CONTINUOUS MEASUREMENT OF SMALL VARIATIONS OF MASS

Witold Lewandowski, Olsztynska str. 8c/11; Ryszard Werkowski, Gospody str. 11d/21, both of Gdansk-Oliwa, and Henryk Gliszewski, Marchlewskiego str. 10E/6, Gdansk-Wrzeszcz, all of Poland

Filed Aug. 27, 1973, Ser. No. 391,680
Claims priority, application Poland, Aug. 28, 1972, 157523
Int. Cl.² G01G 5/04
U.S. Cl. 177—208 1 Claim

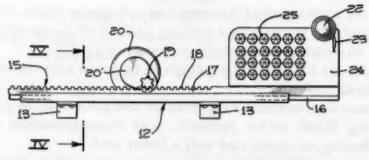
1. An analytical precision balance for continuous measurement of small variations of mass, said balance comprising a balance beam, a knife-edge support for said balance beam disposed at an intermediate location along the length thereof, means for suspending a body whose mass is to be measured on said beam at a location spaced from said knife-edge support, a diaphragm fixedly secured to said balance beam, a stationary nozzle spaced from and facing said diaphragm, said diaphragm having a spherical surface facing said nozzle, a low-pressure fluid source, conduit means coupled to said source for supplying low pressure fluid to said nozzle to form a fluid cushion between the nozzle and the diaphragm to assist in balance of said beam, the balance position of the beam changing due to variation in mass of said body to vary the spacing between the nozzle and the diaphragm, such variation producing pressure change of the fluid in said conduit means, and indicator means coupled to said conduit means for responding to said pressure change of the fluid in said conduit means to provide a continuous measurement of small variations of the mass of said body.



3,905,435
SIGNALING SYSTEM FOR USE ON AUTOMOTIVE VEHICLES

Telesforo G. Coronado, 2451 Balboa St., Oxnard, Calif. 93030

Filed June 17, 1974, Ser. No. 480,119
Int. Cl.² B60Q 1/26
U.S. Cl. 180—1 AP 6 Claims



1. In combination with an automotive vehicle, having a front driving compartment and a rear, enclosed body portion terminating in a back, the provision of:

carriage means extending longitudinally of the vehicle in a normally concealed position, said carriage including light-reflective signal means;

means for moving said carriage longitudinally from a concealed position wherein the signal means is concealed to a visible position about 18 inches to about 30 inches beyond the back of the vehicle.

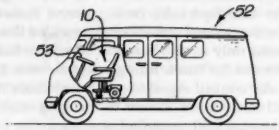
and means for selectively controlling the movement of said carriage from the driving compartment.

3,905,436

ADJUSTABLE WHEELCHAIR

Andrew Karchak, Jr., and James R. Allen, both of Downey, Calif., assignors to Wheelchairs, Inc., Paramount, Calif.

Filed Apr. 22, 1974, Ser. No. 462,665
Int. Cl.² A61G 5/04; B60N 1/08; B62D 11/04
U.S. Cl. 180—6.5 7 Claims



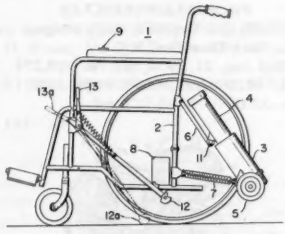
1. In an adjustable wheelchair,
a. a carriage including support wheels,
b. a seat and a support frame therefor,
c. means supporting the seat and frame for movement relative to the carriage while maintaining the frame and seat firmly connected with the carriage, said means including a motor driven elevator mounted on the carriage and connected with the frame to raise and lower the seat, and linear guides also mounted on the carriage and connected with the frame to guide said raising and lowering of the seat and to block lateral movement of the seat and frame relative to the carriage, and
d. the frame including a portion proximate the seat configured for retention by chair retaining structure integral with a motor vehicle body in response to said seat and frame movement relative to the carriage, said portion integral with the frame.

3,905,437

ELECTRICALLY DRIVABLE WHEELCHAIR

Yasuharu Kaiho, Akikawa, and Takeo Hirota, Zushi, both of Japan, assignors to Kabushiki Kaisha U. M. I., Tokyo, Japan

Filed July 19, 1974, Ser. No. 490,056
Claims priority, application Japan, July 27, 1973, 48-83975
Int. Cl. B60s 9/20
U.S. Cl. 180—15 8 Claims



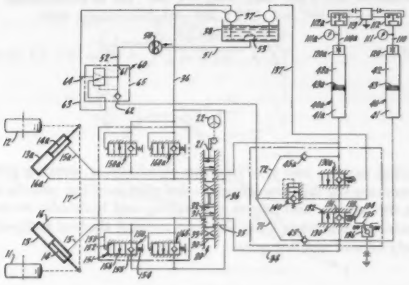
1. In a wheelchair of the type having a chassis, a pair of side wheels with hand rims, and at least one front wheel, the improved combination thereof with an electric driving means comprising a main body including an electric motor, a jack portion including free-running mechanisms and a jackscrew coupled to said electric motor, and driving wheels also coupled to said electric motor, said electric driving means being attached extensibly and contractably to a rear part on the wheelchair through supporting means and spring means.

3,905,438

HYDRAULIC STEERING SYSTEM FOR OFF-HIGHWAY VEHICLE

F. Sheldon Runyon, Morton; Lawrence D. Strantz, Washington; Darryl S. Webb, Germantown Hills, and Charles E. Phenix, Peoria, all of Ill., assignors to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Nov. 1, 1974, Ser. No. 519,875
Int. Cl.² B62D 5/06
U.S. Cl. 180—79.2 R 6 Claims



1. In a steering system for an off-highway vehicle having a pair of steerable wheels, the combination comprising, double acting hydraulic steering cylinders coupled to the wheels, means for interconnecting the wheels for steering in unison, a pair of pressurized hydraulic lines, a return line having an associated sump, a pair of steering valves interposed between the pressurized lines and the respective steering cylinders and mechanically connected to the vehicle steering wheel, the steering valves having provision for drainage to the sump, each of the steering valves being of the type having a blocked center position and having alternate end positions in which respective ends of the cylinders are pressurized for steering to right and left, a continuously operating positive displacement pump having an associated unloading valve for pumping of hydraulic fluid from the sump into the pressurized lines, accumulators in the pressurized lines, respective check valves interposed between the outlet of the unloading valve and the pressurized lines so that in the event of failure of the pressurized line associated with one of the cylinders the remaining cylinder remains effective to steer the vehicle to a stop, the unloading valve having a main inlet-outlet passageway and a return port with a poppet at the inlet for sealing off the return port and a pressure sensing valve at the outlet for controlling the poppet so that when a predetermined drop in pressure occurs at the outlet, the sensing valve operates the poppet to feed fluid through the check valves to replenish fluid in the accumulators until a predetermined outlet pressure is reestablished and to thereafter divert the pumped fluid at low pressure through the return port while pressure in the pressurized lines is maintained by the check valves.

3,905,439

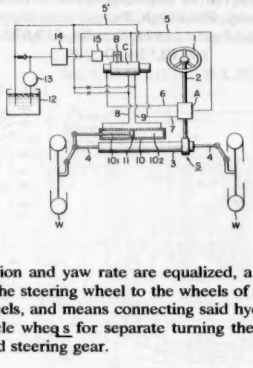
COURSE CORRECTING DEVICE FOR A VEHICLE

Kimio Miura, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,658
Int. Cl.² B62D 5/08
U.S. Cl. 180—79.2 R 1 Claim

1. A course correcting device for a vehicle comprising steering motion detector means for producing an oil pressure output proportional to the amount of steering motion given to a steering wheel thereof, yaw rate detector means for producing an oil pressure output proportional to the detected amount of yaw rate of the vehicle, oil pressure comparator means for producing an oil pressure output proportional to any pressure difference between said oil pressure outputs of said steering

motion means and said yaw rate detector means, oil hydraulic means operable under the control of the oil pressure output of said oil pressure comparator means to correct the turning movement of the steered wheels of the vehicle so that the



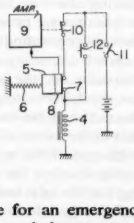
steering motion and yaw rate are equalized, a steering gear connecting the steering wheel to the wheels of the vehicle to turn the wheels, and means connecting said hydraulic means to said vehicle wheels for separate turning thereof independently of said steering gear.

3,905,440

CONTROL DEVICE FOR EMERGENCY LOCK TYPE VEHICLE SAFETY BELT

Motohiro Okada, Tokyo, and Taiji Omori, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1974, Ser. No. 459,366
Claims priority, application Japan, Apr. 10, 1973, 48-40552
Int. Cl.[2] B60R *21/00*
U.S. Cl. 180—82 C **14 Claims**



1. A control device for an emergency lock type vehicle safety belt, comprising a belt retractor, means operable to lock said belt retractor, a mechanical G-sensor switch, and an electrical G-sensor switch both connected in series with said means to control the same, said second G-sensor switch being so constructed and arranged as to operate in advance of said first G-sensor switch in response to forces applied to said vehicle whereby arcing at the mechanical switch is substantially avoided.

3,905,441

METHOD AND APPARATUS FOR CONTROLLING THE BRAKES OF VEHICLES

Shoji Kawata, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed June 19, 1973, Ser. No. 371,362
Claims priority, application Japan, June 22, 1972, 47-62676
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—98 **4 Claims**

1. Brake control apparatus for vehicles having a fluid pressure source for providing a substantially constant fluid pressure, hydraulic brake means for arresting the movement of said vehicles, and accelerator means movable in a given direction from a predetermined position for accelerating said vehicles, comprising:

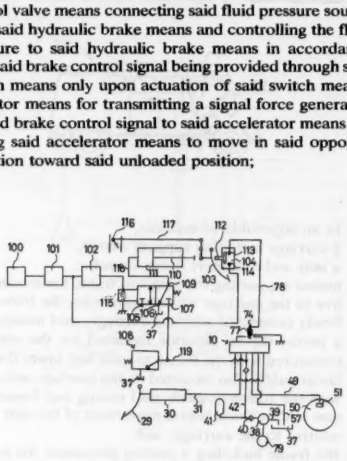
a sensor for detecting the distance between two vehicles;

a brake control signal generator for generating a brake control signal as a result of an input from said sensor;

switch means capable of being actuated by said accelerator means upon movement thereof in a direction opposite to said given direction to a predetermined unloaded position;

a control valve means connecting said fluid pressure source with said hydraulic brake means and controlling the fluid pressure to said hydraulic brake means in accordance with said brake control signal being provided through said switch means only upon actuation of said switch means;

actuator means for transmitting a signal force generated by said brake control signal to said accelerator means for urging said accelerator means to move in said opposite direction toward said unloaded position;



and

changeover valve means being disposed between said actuator means and said fluid pressure source and connecting said fluid pressure source with said actuator means for causing said actuator means to transmit said signal force to said accelerator means in accordance with said brake control signal from said brake control signal generator for so long as said brake control signal generator receives an input from said sensor,

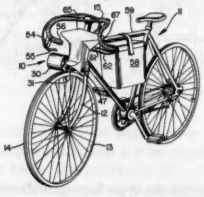
wherein the operation of said hydraulic brake means through said brake control signal is capable of being terminated by the continuous depression of said accelerator means in said given direction against the signal force of said actuator means.

3,905,442

ELECTRICALLY DRIVEN ASSIST UNIT FOR RIDER PROPELLED VEHICLES

Joseph P. O'Neill, Jr., Deptford, N.J., assignor to General Engines Co., Inc., Thorofare, N.J.

Filed Aug. 21, 1974, Ser. No. 499,274
Int. Cl.[2] B62D *61/02, 61/08;* **B60K** *1/00, 17/14*
U.S. Cl. 180—33 D **9 Claims**



1. An electrically driven assist unit for bicycles and tricycles comprising a supporting frame adapted to be secured to and supported by a front wheel fork, a motor support, means mounting said motor support on the frame for up and down movement, an electric motor secured to and supported by said motor support, a friction wheel secured to the shaft of said motor and disposed over the front wheel tire, a spring means

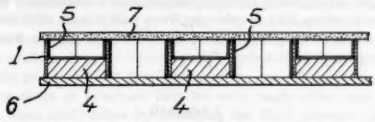
normally retaining said motor support, motor and friction wheel in raised positions with said friction wheel out of engagement with the tire, a switch housing, means supporting the switch housing on said frame above the motor support for up and down movement, an electric switch contained in said switch housing and interposed in an electric circuit of the motor, yieldable means connected to a movable contact of said switch, said yieldable means being carried by the switch housing and bearing on the motor support for normally holding the switch housing in a raised position with said movable contact out of engagement with a stationary contact of the switch, and manually actuated means connected to the switch housing for moving the switch housing downwardly to cause said yieldable means to displace the motor support downwardly for engaging the friction wheel with the tire and for thereafter moving the movable contact into engagement with the stationary contact for closing the electric circuit to the motor.

3,905,443

WALLS WITH RESONANT CAVITIES

Jean Louis Sieuzac, 3, rue de Sfax, 75016 Paris, France

Filed Nov. 1, 1973, Ser. No. 411,900
Claims priority, application France, Nov. 6, 1972, 72.39247
Int. Cl. E04b *1/99*
U.S. Cl. 181—33 G **4 Claims**



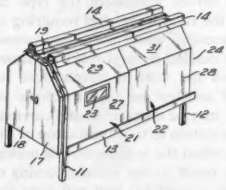
1. A method of making a sound absorbing wall having resonant cavities of different depths and different frequency absorption characteristics extending with parallel transverse axes, said method comprising the steps of providing a structure having honeycomb cavities with parallel axes, forcing said structure through a sheet of cured plastic foam which provides a foam plug filling an identical portion of each cavity, selectively removing the foam plugs from desired ones of said cavities in order to obtain cavities of different depths and different frequency absorption characteristics, gluing a closure plate to one side of said structure and gluing a porous plate to other side of said structure.

3,905,444

SOUNDPROOFING ENCLOSURES

William O. Evans, Jr., 218 E. Streetsboro St., Hudson, Ohio 44236

Filed Aug. 30, 1974, Ser. No. 502,143
Int. Cl.² E04B *1/99*
U.S. Cl. 181—33 K **13 Claims**



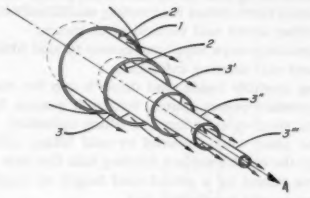
1. A machine enclosure or the like comprising a generally rectangular frame having sides and ends, a pair of soundproofing side panels on each side of said frame, cooperating with each other in a closed position to close one side of said frame, each side panel being moveable in the direction of its length to an intermediate position in which it substantially overlaps the other panel of said pair to provide an opening and partial access to an enclosed machine, each pair of panels being moveable in the direction of its length to a fully opened position in which each panel is supported clear of said frame.

3,905,445

VORTEX TURBULENCE NOISE GENERATION SUPPRESSOR

Terry D. Scharton, Santa Monica, Calif., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Continuation of Ser. No. 217,369, Jan. 12, 1972, abandoned.
This application July 20, 1973, Ser. No. 381,000
Int. Cl.² F01N *1/00*
U.S. Cl. 181—46 **8 Claims**



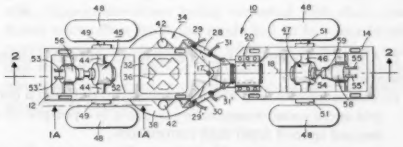
1. A noise generation suppressor for breaking up the exhaust of a jet outlet into a plurality of streams while minimizing flow-dividing drag, having, in combination, means including a plurality of successive longitudinally extending passages of successively smaller cross-dimension for dividing said exhaust into a plurality of streams and for breaking up the vortex pattern of said exhaust, each of said passages having an inlet at one end and an outlet at the opposite end, each inlet being located adjacent the outlet of the preceding passage and remote from the inlet of the preceding passage, and each passage being substantially freely open and devoid of transverse sub-division along said cross-dimension throughout most of its length.

3,905,446

SELF-PROPELLED SEISMIC SIGNAL GENERATOR

Walter T. Ross, deceased, late of Houston, Tex. (by Elizabeth T. Ross, executrix), assignor to Western Geophysical Company of America, Houston, Tex.

Continuation of Ser. No. 159,911, July 6, 1971, abandoned.
This application June 8, 1973, Ser. No. 368,403
Int. Cl.² G01V *1/04*
U.S. Cl. 181—114 **2 Claims**



1. In combination, a seismic vibrator having a base plate movable in a vertical direction and being adapted to engage the earth's surface; and

a self-propelled vehicle for transporting and for adding inertia mass to said base plate when vibrating,

said vehicle comprising a first bed frame defining a central open area adapted to movably receive therein said vibrator, a driver's cab on said first frame;

a second bed frame, a primary power source and two hydraulic pumps mounted on said second frame, said pumps being driven by said primary power source;

a pair of axles on each bed frame, a wheel mounted on each axle,

drive means, including a differential transmission and a hydraulic motor for supplying power to each pair of axles, said hydraulic pumps supplying hydraulic power to drive the motor on each bed frame whereby each motor is independently powered;

horizontal pivot means for pivotally interconnecting said bed frames for relative rotation about said horizontal pivot means, vertical pivot means for pivotally interconnecting said frames for relative rotation about said vertical pivot means;

a pair of hydraulic lifting cylinders on said first bed frame for raising and lowering said vibrator;

steering means, including two hydraulic steering cylinders interconnecting said bed frames on opposite sides of said horizontal pivot means for rotating said frames relative to each other about said vertical pivot means;

said hydraulic pumps supplying power to said lifting cylinders and said steering cylinders;

operating controls inside said driver's cab for controlling said: primary power source, hydraulic pumps, hydraulic motors, steering cylinders and lifting cylinders;

said base plate when lowered by said lifting cylinders to engage the earth's surface causing said first bed frame to become raised by a preselected height to supply static loading to said base plate, and

means for vibrating said base plate to thereby inject a seismic signal into the ground.

3,905,447

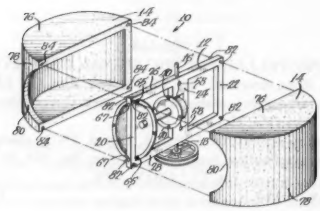
LOW INERTIA TREMOLO UNIT

Ray B. Schrecongost, Park Ridge, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Oct. 29, 1973, Ser. No. 410,512

Int. Cl.[2] G10K *7/00;* **H05K** *5/00*

U.S. Cl. 181—143 **7 Claims**



1. A tremolo assembly for an electronic musical instrument comprising:

an enclosure of sound absorbing material defining a central axis and a sound-transmitting opening in a peripheral area thereof spaced from said central axis;

means for supporting said enclosure for rotation about said central axis;

a speaker cone mounted in said peripheral area of said enclosure adjacent said sound-transmitting opening;

a driver assembly for said speaker cone, including a voice coil form, mounted within said enclosure at a position such that said central axis of said enclosure intersects said driver assembly; and

a longitudinally rigid coupling element mounted between said voice coil and said speaker cone;

whereby the moment of inertia of said tremolo assembly is substantially reduced to permit rapid acceleration and deceleration thereof.

3,905,448

LOUDSPEAKER

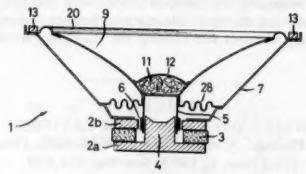
Hirotake Kawakami; Toshio Sasabe, both of Tokyo; Toshio Hirosawa, Yokohama; Naomi Sakai, Yokohama; Nobuyuki Arakawa, Yokohama; Kozo Kokubu, Yokohama; Kazumasa Abe, Tokyo, and Toshiko Harashino, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,154

Claims priority, application Japan, July 2, 1973, 48-78632[U]

Int. Cl.[2] G10K *13/00;* **H04R** *7/00*

U.S. Cl. 181—172 **9 Claims**



1. A loudspeaker comprising a diaphragm with a voice coil, a frame surrounding said diaphragm, and a suspension means for suspending said diaphragm from said frame, said suspension means being formed of a mixture of elastic material impregnated with carbon fibers.

3,905,449

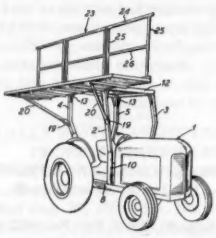
SCAFFOLD ON ROLL-OVER FRAME ON A VEHICLE

Billie J. Uphoff, Morton, Ill., assignor to Morton Buildings, Inc., Morton, Ill.

Filed Aug. 30, 1973, Ser. No. 392,881

Int. Cl.[2] E04G *1/24;* **B60R** *27/00*

U.S. Cl. 182—82 **6 Claims**



1. A motor driven vehicle of the type capable of being driven for off the road travel and requiring a roll over frame for driver protection, wherein the improvement comprises a superstructure carried by said roll over frame adjustable for operation when the vehicle travels over relatively smooth ground to add another use to the vehicle and wherein said superstructure may be dismantled and carried by said roll over frame in such location as to leave the top of the roll over frame clear and free when the vehicle travels under conditions that could possibly result in the vehicle turning over, said superstructure being a scaffold, said roll over frame including a plurality of upstanding bars connected at their upper ends by a canopy, and said scaffold including a catwalk pivoted at one side of said roll over frame to a pair of said bars adjacent said canopy, a guard railing removably mounted on said catwalk along one side thereof, and removable brace means to hold said catwalk in horizontal position.

3,905,450

METHOD AND APPARATUS OF LUBRICATING SEALING RINGS DISPOSED AXIALLY BETWEEN TWO MACHINE ELEMENTS

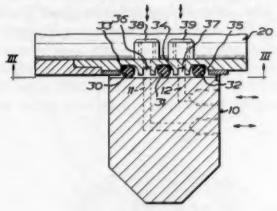
Bror Arthur Persson, Kvidinge, Sweden, assignor to Ingvar Valentin Falk, Helsingborg, Sweden

Filed June 17, 1974, Ser. No. 479,839

Claims priority, application Sweden, June 19, 1973, 73085995

Int. Cl. F01m *9/00*

U.S. Cl. 184—6.14 **17 Claims**



1. A method of lubricating a pair of sealing rings mounted axially beside one another and together defining a pressure fluid distribution space between two machine elements arranged for rotation in relation to each other and about the axis of the sealing rings, comprising the steps of feeding a lubricant into the pressure fluid distribution space, axially displacing the sealing rings at intervals first towards each other and then away from each other by changing the fluid pressure in the pressure fluid distribution space, and deforming the sealing rings in an axiel sense into a shape deviating from the shape of an annular body of rotation.

13. The assembly of claim **12,** wherein said groove-defining wall means defines annular grooves wider than said sealing rings.

3,905,451

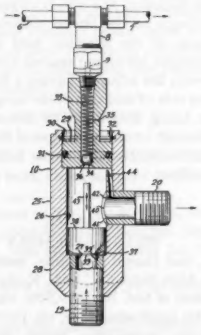
PRESSURE OILING SYSTEM AND OILING VALVE ASSEMBLY

James Byron Williamson, P. O. Box 55, Alachua, Fla. 32615

Filed Nov. 29, 1973, Ser. No. 420,261

Int. Cl.² F16N *27/00*

U.S. Cl. 184—7 D **6 Claims**



1. An oiling valve for a compressed air line comprising an upright hollow cylinder having a lower end provided with an air inlet opening, an upper end provided with an oil inlet opening and a side wall having an air outlet port disposed spacedly between said upper and lower ends, a piston having a loose fit in said cylinder, means forming an oil pressure chamber opening into said cylinder through said oil inlet opening, a check valve comprising a movable valve member for closing the opening from said oil pressure chamber into said cylinder, and a pin engagable between said valve member and said piston upon lifting of said piston away from said lower end in response to compressed air flow from said air inlet opening to said outlet port.

3,905,452

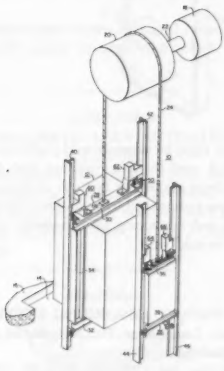
ELEVATOR SYSTEM WITH GUIDE RAIL CLEANING DEVICES

Ernest J. Schirmer, Closter, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1973, Ser. No. 417,691

Int. Cl.² B66B *7/12*

U.S. Cl. 187—1 R **4 Claims**



1. An elevator system, comprising:

an elevator car,

motive means for moving said elevator car,

guide rails each having a plurality of guide surfaces for guiding said elevator car,

and means detachably mounted on said elevator car for simultaneously cleaning the guide surfaces of at least one of said guide rails during movement of said elevator car, said means including a plurality of rotatable support members with cleaning devices mounted thereon, said cleaning devices each being yieldably biased against a guide surface of a guide rail with their associated rotatable support members being mounted with their rotational axes offset from the guide rail to be cleaned and perpendicular to an extension of the guide surface, such that movement of the car will cause a dragging, scouring rotational movement of cleaning devices over the associated guide surfaces.

3,905,453

ELEVATOR MECHANISM AND METHOD

Edmund Frank, Chicago, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

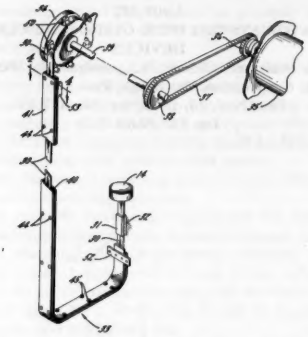
Division of Ser. No. 241,987, April 7, 1972, abandoned, Continuation-in-part of Ser. No. 368,693, June 11, 1973. This application Jan. 12, 1973, Ser. No. 322,965

Int. Cl. B66b *11/04*

U.S. Cl. 187—17 **5 Claims**

1. An elevator mechanism for raising and lowering items in a vertical well, said elevator mechanism comprising the combination of a platform mounted for vertical movement through said well, an elongated flexible member having only

one end secured to only the bottom of said platform and extending downwardly from said platform through said well, laterally away from said well below the bottom thereof, and then upwardly with said flexible member terminating with its other end at an elevation above said well, said flexible member being unsupported along the length of travel of said platform

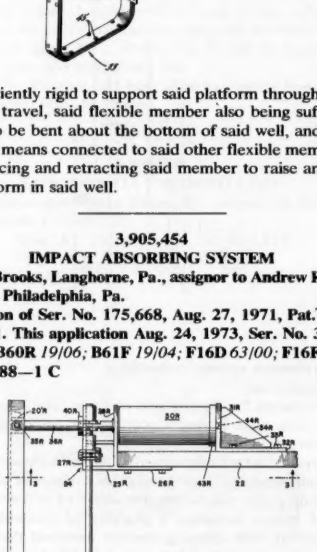


and sufficiently rigid to support said platform throughout said length of travel, said flexible member also being sufficiently flexible to be bent about the bottom of said well, and reversible drive means connected to said other flexible member end for advancing and retracting said member to raise and lower said platform in said well.

3,905,454
IMPACT ABSORBING SYSTEM

Ralph J. Brooks, Langhorne, Pa., assignor to Andrew R. Klein, trustee, Philadelphia, Pa.

Division of Ser. No. 175,668, Aug. 27, 1971, Pat. No. 3,851,911. This application Aug. 24, 1973, Ser. No. 391,370
Int. Cl.[2] B60R *19/06;* **B61F** *19/04;* **F16D** *63/00;* **F16F** *13/00*
U.S. Cl. 188—1 C **1 Claim**

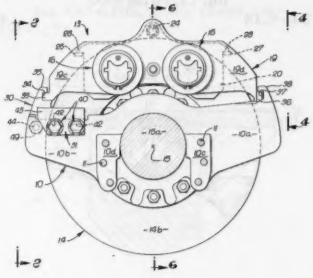


1. Method for dissipating the energy incident to a vehicular collision which comprises the steps of absorbing a major portion of the energy initially generated at the vehicle bumper by applying it radially to the movable end of a torsion bar; and absorbing energy in excess of that absorbed by said torsion bar by expending it to crush a mass of crushable material confined in housing means rigidly positioned on the vehicle.

3,905,455
DISC BRAKE CALIPER AND TORQUE ARM INTERFACE ASSEMBLY AND RETENTION

Samuel J. Martins, Reseda, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.

Filed June 24, 1974, Ser. No. 482,314
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—73.3 **8 Claims**



1. In an assembly for braking a rotary disc having an axis and defining a plane normal to said axis,
   a. a torque arm,
   b. a caliper adapted to straddle the disc during disc rotation relative to the caliper, and
   c. a braking element carried by the caliper to face one side of the disc, and
   d. means coupling the caliper to the torque arm for initial adjustment displacement in a lateral direction generally parallel to said disc, and for subsequent shifting displacement in a generally longitudinal axial direction relative to the torque arm and disc during braking, said means including an adjuster adjustably attached to one of the torque arm and caliper for selective displacement relative thereto, the adjuster having a first coupling with the other of the caliper and torque arm to shift the caliper generally laterally in response to said relative displacement of the adjuster, the first coupling defining first tongue and groove elements providing first longitudinally extending guideways, said means also including a second coupling between the torque arm and caliper at a location laterally spaced from said adjuster, said second coupling defining second tongue and groove elements having wedge interfit in a lateral direction and which increases or decreases in correspondence to the lateral direction of said relative displacement of the adjuster, said second tongue and groove elements providing second longitudinally extending guideways the adjuster having a flange at a longitudinally facing side of said one of the torque arm and caliper, and there being longitudinally extending fasteners extending through laterally elongated slots in said flange to adjustably attach the adjuster to said one of the torque arm and caliper.

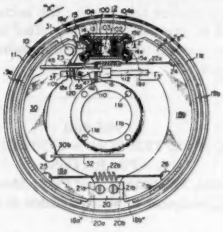
3,905,456
BRAKE ASSEMBLY

Tatsumi Torii, and Haruo Miyajima, both of Kariya, Japan, assignors to Aisin Seiki Co., Ltd., Kariya, Japan

Continuation of Ser. No. 809,509, March 24, 1969, abandoned. This application Mar. 10, 1971, Ser. No. 123,056
Claims priority, application Japan, Mar. 22, 1968, 43-18672
Int. Cl. F16d *65/54*
U.S. Cl. 188—79.5 P **5 Claims**

1. An automotive vehicle brake assembly comprising, a stationary backing plate fixedly attached to an axle support means, a pair of brake shoes movably disposed on said backing plate opposite one another, a hydraulic actuator disposed

on said backing plate between two adjacent ends of said brake shoes and operatively connected therewith, a stationary anchor secured to said backing plate between the two remaining adjacent ends of said brake shoes, said remaining adjacent ends of said brake shoes being in abutting relationship with said stationary anchor, a rotatable brake drum positioned around said brake shoes for frictional engagement therewith, an automatic brake adjusting means positioned adjacent said hydraulic actuator, one end of said automatic adjusting means being operatively connected with one of said brake shoes and the other end of said automatic adjusting means being operatively connected with the other of said brake shoes, said one of end of said automatic adjusting means having a threaded ratchet wheel assembly attached thereto, said ratchet wheel assembly including a wheel having pawl teeth formed on its outer periphery and screw portion in threaded engagement with said wheel, a ratchet wheel actuating means movably connected with said one end of said automatic adjusting means and being operatively connected with said one brake



shoe, said ratchet wheel actuating means comprising a resilient lever, said resilient lever being adapted for rotation with relative movement between said shoe and said ratchet wheel assembly for rotating said ratchet wheel to extend said screw portion from said ratchet wheel, a mechanically actuated lever having one end theroef pivotally connected to one of said brake shoes adjacent said hydraulic actuating means and the other end thereof operatively connected to a mechanical actuating means, said one end of said automatic adjusting means being operatively connected to said mechanically actuated lever between the ends thereof and adjacent the end that is pivotally connected to said brake shoe, and biasing means connected to each of said brake shoes for biasing said brake shoes to their non-applied position, whereby, when said brake shoes are actuated said resilient lever is caused to move relative to said ratchet wheel to adjust the clearance between said brake shoes and said rotating brake drum when said brake shoes are returned to their non-apply position and the clearance between said brake shoes and said rotating brake drum exceeds a predetermined amount.

3,905,457

TRANS-AXLE WITH INTEGRAL BRAKING

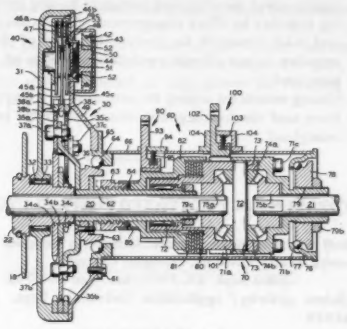
Dennis W. Shea, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 445,716, Feb. 25, 1974, which is a continuation-in-part of Ser. No. 384,815, Aug. 2, 1973, abandoned. This application May 24, 1974, Ser. No. 473,103

Int. Cl.[2] **F16H** *57/10;* **F16D** *41/24*

U.S. Cl. 192—5 **8 Claims**

1. A trans-axle with integral braking assembly comprising in combination, a housing, a pair of aligned and independent output shafts mounted within said housing and having ends extending outwardly of said housing, differential means within said housing and operatively connected to said output shafts, planetary transmission means within said housing concentric with and carried on one of said output shafts and drivingly connected to said differential means for driving said output shafts, input means drivingly connected to said planetary transmission means, and braking means operatively connected



between said differential means and said housing for braking said output shafts upon reverse movement of said input means.

3,905,458

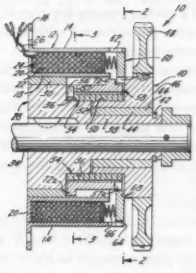
ELECTRO-MAGNETICALLY ACTUATED SPRING CLUTCH

Alphonso W. Mehrbrodt, Brecksville, Ohio, assignor to Marquette Metal Products Company, Cleveland, Ohio

Filed June 26, 1974, Ser. No. 483,130

Int. Cl. F16d *11/06, 13/02, 37/02*

U.S. Cl. 192—26 **10 Claims**



1. An electro-magnetically actuated spring clutch comprising:

a. a stationary housing;

b. an input drum mounted for rotation in said housing;

c. an output drum disposed in said housing and supported for rotation adjacent and coaxial to the input drum;

d. a coil spring disposed to surround said input and output drums;

e. a control member arranged to surround said coil spring and in engagement with the coil spring to effect, in one operative position, contraction of the coil spring to grip the input and output drums and thereby transmission of rotation from the input to the output drums and in another operative position, expansion of the coil spring to interrupt such rotary transmission;

f. an electro-magnetic means disposed within said housing in close spaced coaxial relationship with and surrounding said control member;

g. a ring-shaped armature supported against rotation by the housing adjacent said electro-magnetic means and free to move axially relative to the housing so as to be capable of slidable movement toward and away from said control

sleeve and electro-magnetic means upon energization and de-energization of said electro-magnetic means;

h. said control member and armature having means coacting together to effect engagement of the control member and said armature to prevent rotation of the control member in one of said operative positions of the armature; and

i. biasing means for urging the armature in a direction away from said electro-magnetic means when the latter is de-energized.

3,905,459

HYDRAULICALLY ACTUATED PLATE CLUTCH WITH ACCUMULATOR

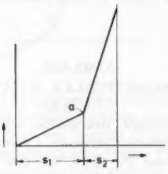
Rudolf Liebich, Klein-Berkel, Germany, assignor to Eisenwerke Reintjes GmbH, Hameln, Germany

Filed Sept. 13, 1973, Ser. No. 396,712

Claims priority, application Germany, Sept. 13, 1972, 2244919

Int. Cl.[2] F16D *25/00*

U.S. Cl. 192—109 F **3 Claims**



1. Control means for hydraulically actuating a plate clutch having at least one first clutch plate and at least one second clutch plate and a piston means for moving said first plate in a first direction into engagement with said second plate, said control means comprising:

means under stress and operatively connected to said piston means for resiliently biasing said piston means in a second direction opposite to said first direction and for normally holding said first plate out of engagement with said second plate, whereby when said piston means moves in said first direction said biasing means becomes increasingly stressed,

a source of fluid,

first conduit means in fluid communication with said piston means for transmitting fluid under pressure from said source to said piston means to move said piston means in said first direction, thereby increasingly to stress said biasing means,

a pump in said first conduit means between said source and said piston means for supplying fluid under pressure to said piston means,

first valve means in said first conduit means for interconnecting said pump with said piston means through said first conduit means in a first position of said first valve means and bypassing said pump and interconnecting said piston means with said source in a second position of said first valve means,

a fluid accumulator,

second conduit means for selectively interconnecting said accumulator with said first conduit means,

automatically openable second valve means disposed in said second conduit means, means biasing said second valve means to remain in a closed condition until after said piston means have moved a preselected distance in said first direction and said means resiliently biasing said piston means has thereby become stressed a preselected amount, said second valve means being responsive to pressure build up resulting from stressing said means biasing said piston means to only then place said accumulator in communication with said first conduit means to receive part of the fluid which would otherwise by transmitted to said piston means, thereby to decrease the rate of movement of said piston means in said first direction,

third conduit means connected between said accumulator and said first conduit means,

one way valve means in said third conduit means, fluid pressure in the portion of said third conduit means between said one way valve means and said first conduit means maintaining said one way valve means closed while said first control valve means is in said first position and until said first control valve means is moved to said second position at which time fluid pressure in the portion of said third conduit means between said accumulator and said one way valve means exceeds the fluid pressure in the portion of said third conduit means between said first conduit means and said accumulator at which time said one way valve means opens and said accumulator discharges fluid into said first conduit means for flow of fluid to said source,

whereby said piston means moves at a first faster rate during the first portion of its movement in said first direction and at a second slower rate during the second portion of its movement in said first direction after said second valve means has opened to establish communication with said accumulator.

3,905,460

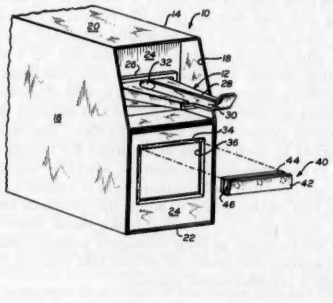
COIN BOX ADAPTER FOR A COIN CONTROLLED APPARATUS

Harry Greenwald, Whitestone, and Perry Sherman, Oceanside, both of N.Y., assignors to Walter Kidde & Co., Inc., Clifton, N.J.

Filed Oct. 15, 1974, Ser. No. 514,419

Int. Cl.[2] G07F *9/06*

U.S. Cl. 194—1 B **7 Claims**



1. In combination with a coin operated apparatus having a housing, an opening in a wall of the housing for removably receiving a first sized coin box therein, and said coin box supported within the housing for receiving coins deposited in the apparatus; wherein the improvement comprises:

a. an adapter for decreasing the size of the wall opening to accept a second sized coin box of smaller size than the first sized coin box;

b. said adapter comprising a first plate, a second plate and an intermediate plate between said first and second plates;

c. said first and second plates having an edge extending beyond the corresponding edge of the intermediate plate to define a groove therebetween adapted to receive a portion of the wall adjacent an edge of the opening; and

d. means for clamping the first and second plates together to mount the adapter to the wall portion of the housing;

e. said first and second plates extending into the wall opening to reduce the size of said opening.

3,905,461
ACCESS-CONTROL EQUIPMENT

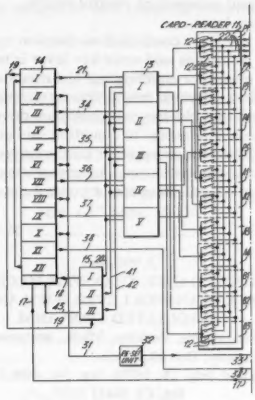
Anthony Ivan Oliveira Davies, Gerrards Cross, England, and James Goodfellow, Paisley, Scotland, assignors to Chubb Integrated Systems Limited, London, England

Filed May 1, 1967, Ser. No. 635,075

Claims priority, application United Kingdom, May 2, 1966, 19319/66

Int. Cl. G06k *7/00*

U.S. Cl. 194—4 C **6 Claims**



1. Access-control equipment for selectively enabling access to a facility comprising:

first means for receiving a coded token presented to the equipment to read from the received token information encoded thereon,

second means that is operable manually for entering into the equipment a plural-character word, the word entered being dependent upon manual selection,

third means that is selectively operable for enabling access to said facility,

fourth means to effect comparison for correspondence between said information read from the token and said word entered into the equipment, said fourth means including means to operate said third means to enable access to said facility in dependence upon whether a predetermined correspondence exists between said information and said manually entered word,

and recording means including a printer for providing a printed record of said information.

3,905,462
MULTIELECTRODE ELECTROGRAPHIC PRINTING DEVICE

Gerald Nowak, Neusatz, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Feb. 20, 1974, Ser. No. 444,102

Claims priority, application Germany, Feb. 27, 1973, 2309684

Int. Cl.[2] B41J *3/05*

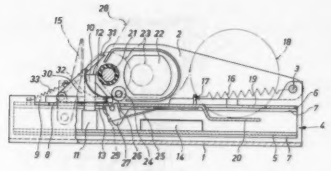
U.S. Cl. 197—1 R **19 Claims**

1. In an electrographic printing device having a printing head, a plurality of juxtaposed electrodes mounted on the printing head, electronic control components supported in the device and coupled to the electrodes for selectively applying an electric potential thereto, a platen situated adjacent the electrodes, means supporting a supply roll of current-sensitive imprint carrier and means guiding the imprint carrier between the electrodes and the platen; the improvement comprising in combination:

a. a carrier disposed in the device, said carrier supporting said electronic control components and said printing head, said carrier and said printing head constituting a unit;

b. a lower part forming a portion of said device; said printing head and said carrier are held in said lower part;

c. a drive motor coupled to said platen for rotating the same; and



d. an upper part pivotally secured to said lower part; said platen and said drive motor are held in said upper part, said upper part constituting a platen supporting means having a first position in which said platen is held in a working position adjacent said printing head and a second position in which said platen is in a lifted-off position with respect to said printing head.

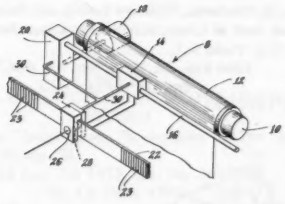
3,905,463
CONTROL ELEMENT FOR ELECTRICAL READING OR RECORDING DEVICE

James J. Boyce, Fresh Meadows, N.Y.; Angelo J. Di Giugno, Norwalk, and James V. Masi, Monroe, both of Conn., assignors to The Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 12, 1973, Ser. No. 331,838

Int. Cl. B41j *3/05*

U.S. Cl. 197—1 R **8 Claims**



1. In an electrically controlled recording device for recording a line of characters on a recording medium,

a recording head movable along a line relative to said medium and operable in response to enabling synchronization signals applied thereto for producing selected strokes along said lines so that each character on the line is formed from a plurality of said strokes,

a synchronization track having spaced synchronization marks located in a fixed position relative to said recording medium, and

detecting means for detecting said synchronization marks during relative movement of said head and said medium for producing a synchronization signal in response to each detected mark, each synchronization signal being controllingly coupled to said recording head for enabling said head to produce a stroke at a location along said line corresponding to the location of said head when the synchronization signal is produced,

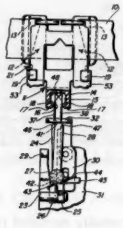
said synchronization marks being spaced on said track so that the strokes produced by said recording head for a character at a first location along said line will be spaced differently from those produced by said recording head for a character at a second location along said line.

3,905,464

RIBBON CHANGE APPARATUS

Thomas E. Frechette, Windsor Locks, and Daniel J. Rosborg, Bristol, both of Conn., assignors to Litton Business Systems, Inc., New York, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,708
Int. Cl.[2] B41J *35/04*
U.S. Cl. 197—170 10 Claims



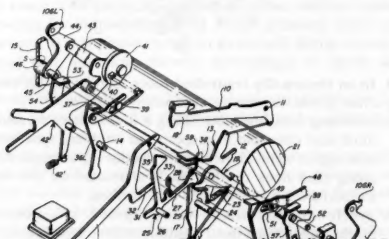
1. In a typewriter having a frame,
a ribbon,
ribbon guide means through which said ribbon is preth-readed,
vibrator means supported on said frame,
means for elevating said vibrator means, and
means on said guide means and said vibrator means for coupling said guide means and vibrator means when typing,
said means comprising a recess in said guide means and means on said vibrator means freely extendable into said recess and engageable therewith as said vibrator means is elevated when typing.

3,905,465

ERROR CORRECTING TYPEWRITER

Thomas E. Frechette, Windsor Locks, and Daniel J. Rosborg, Bristol, both of Conn., assignors to Litton Business Systems, Inc., New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,707
Int. Cl.[2] B41J *29/16*
U.S. Cl. 197—181 9 Claims



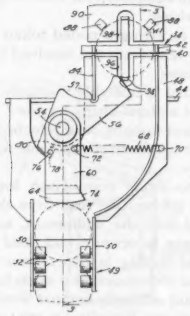
1. A typewriter having key controlled means for typing characters at a relatively movable print point,
a unidirectional inked ribbon drive,
a unidirectinal error correction ribbon drive,
a single ribbon elevating means,
means for supporting an error correction ribbon and an inked ribbon for driving engagement with associated ribbon drives and for movement past said print point through said single ribbon elevating means,
means for enabling one and disabling the other of said ribbon drives to move either said error correction ribbon or said inked ribbon past said print point incident to typing,
said ribbon elevating means including throw selecting means positionable to condition either said inked ribbon or said error correction ribbon for elevation in front of said print point incident to typing,
escapement control means operative incident to and following typing,
interposer means for precluding, when positioned, operation of said escapement control means,
an error key lever,
and error key lever controlled mechanism operative, when and for as long as said error key lever is held depressed, on said means for enabling one and disabling the other of said ribbon drives to enable the error correction ribbon drive and disable the inked ribbon drive, to position throw selecting means to condition said error correction ribbon for elevation opposite said print point incident to typing, and to position said interposer means to preclude operation of said escapement control means incident to typing.

3,905,466

MACHINE LOADER TRANSFER MECHANISM INCLUDING A TRANSFER LEVER WITH AN OPERABLY ASSOCIATED STOP ARM

Walter H. VanDeberg, Berkley, Mich., assignor to F. Joseph Lamb Company, Detroit, Mich.

Filed July 15, 1974, Ser. No. 488,277
Int. Cl. B41j *9/04*
U.S. Cl. 198—25 20 Claims



1. In a mechanism for transferring in succession each of a lineal series of workpieces from a position at the downstream end of a conveyor in an arcuate path to a loading station spaced from the end of the conveyor comprising, a workpiece support extending between the end of the conveyor to said loading station and providing a generally flat support surface, a work transfer lever journalled on an axis generally perpendicular to said planar surface, means for oscillating said lever about said axis in a plane generally parallel to the plane of said support between a retracted position adjacent the end of the conveyor and an advanced position adjacent the loading station, said lever having means thereon which, when the lever is in the retracted position, are adapted to engage the leading workpiece at the end of the conveyor and displace it along said arcuate path to said loading station when the lever swings from the retracted to the advanced position, a stop arm journalled at said axis for rotation in a plane parallel to the plane of oscillation of said lever, said stop arm having a portion disposed at the trailing side of said lever as the lever swings from the retracted to the advanced position, said portion of said arm having a free end spaced radially outwardly from said

axis beyond the workpiece engaging means on said lever, said free end forming an abutment adapted to engage the second-in-line workpiece on the conveyor and thereby restrain advancing movement of the series of workpieces on the conveyor when the leading workpiece is engaged and advanced by the engaging means on said lever, and means including a lost motion connection between the lever and arm for causing said arm to swing to a position wherein its free end is disposed for abutment with the second-in-line workpiece on the conveyor when the lever swings past the end of the conveyor toward the loading station, said last-mentioned means maintaining said arm in said position abutting the second-in-line workpiece until said lever returns to said retracted position.

3,905,467

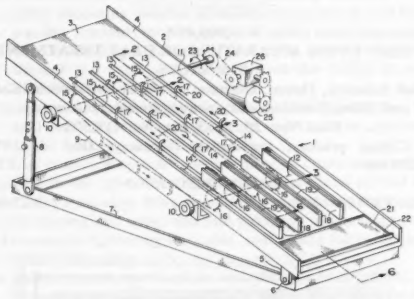
ARTICLE ALIGNING APPARATUS

Peter P. Babik, Canton, Ohio, assignor to Alto Company, York, Pa.

Continuation of Ser. Nos. 226,990, Feb. 16, 1972, abandoned, and Ser. No. 857,304, Sept. 12, 1969, abandoned. This application Feb. 21, 1974, Ser. No. 444,360

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—30 **5 Claims**



1. An article aligning apparatus comprising:

A. an inclined chute for receiving articles to be aligned in rows;

B. a plurality of longitudinal slots in the bottom of the chute;

C. a plurality of spaced-apart upstanding members extending upwardly through the slots and moveable therein;

D. conveyor means having the upstanding members connected thereto, continuously moving the upstanding members longitudinally of the slots from the downstream to the upstream end thereof;

E. said upstanding members contacting any articles sliding down the chute and directing the articles into rows between the paths of travel of said members;

F. means at the lower end of the chute for periodically releasing a predetermined number of articles from each row while retaining any remaining articles in the chute; and

G. longitudinal partition means at the lower end of the chute aligned with the longitudinal slots including a number of partitions each having a longitudinal center slot through which the upstanding members pass.

3,905,468

ARRANGEMENT FOR THE SEPARATION OF OBJECTS SUSPENDED IN BATCHES, PRIMARILY ANODES AND CATHODES FOR ELECTROLYTIC METAL REFINING

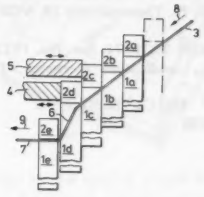
Kjell Erik Lennart Segerstrom, Karlstad, Sweden, assignor to C J Wennberg AB, Karlstad, Sweden

Filed Dec. 3, 1973, Ser. No. 420,861

Claims priority, application Sweden, Dec. 7, 1972, 15949/72

Int. Cl.[2] B65G *47/29*

U.S. Cl. 198—34 **5 Claims**



1. Apparatus for conveying electrodes for electrolytic metal refining, comprising a pair of parallel conveyors that support rod or spigot-shaped suspension devices on the electrodes, a portion of the conveyors sloping downwardly, and a pair of retaining means adjacent said downwardly sloping portion of the conveyors for retaining on said downwardly sloping portion said electrodes and for releasing said electrodes one by one in predetermined spaced relationship to each other for further downward movement along the conveyors, said retaining means comprising a pair of horizontally elongated members disposed one above the other, and means for moving said members relative to each other with a horizontal reciprocatory lengthwise motion in opposite directions relative to each other parallel to the horizontal component of the motion of the electrodes into and out of endwise abutting contact with upper portions of said electrodes, the upper of said pair of members passing directly over the electrode in contact with the lower of said pair of members and into contact with the electrode next to the lastnamed electrode.

3,905,469

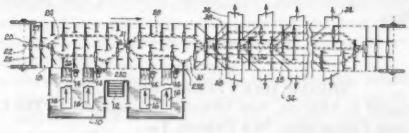
CONVEYOR LOADING AND SELECTIVE DISCHARGE SYSTEM

John Harrison, Lincolnwood, Ill., assignor to The Spra-Con Company, Chicago, Ill.

Filed Apr. 19, 1973, Ser. No. 352,507

Int. Cl. B65g *43/00*

U.S. Cl. 198—38 **15 Claims**



1. In a system for loading articles on a conveyor wherein table means are provided for supporting the articles alongside the conveyor, said conveyor moving adjacent the table means, and including pushers mounted for movement over said table means to engage the articles and to transfer the articles to the conveyor, the improvement in means for mounting said pushers comprising a main track, said main track extending parallel with said conveyor, at least one side track extending away from said main track, said side track extending over said table means for directing said pushers to said table means, switch means at an intersection to said main track and said side track, means normally holding the switch means in the open position whereby said pushers normally remain on said main track, and

means for operating said switch means when an article is present on said table means whereby a pusher moves over the table means to engage an article and move the article from the table means, said side track extending back to said main track whereby a pusher on the side track is moved back to said main track after moving over said table means, and whereby the associated article is moved onto the conveyor.

3,905,470
STOW ROLLER TRAIN

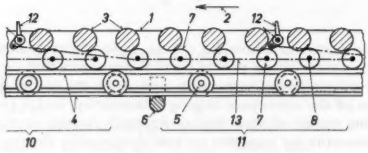
Richard Gebhardt, H. Thomastrasse 10, 6920 Sinsheim, Germany

Filed Oct. 20, 1971, Ser. No. 191,028

Claims priority, application Germany, Oct. 26, 1970, 2052418

Int. Cl.[2] B65G *13/02*

U.S. Cl. 198—127 R **13 Claims**



1. A stow roller train for the storage and transportation of articles without jamming of such articles comprising: frame means, load carrying rollers for conveying the articles rotatably mounted in said frame means, driving means for rotating said load carrying rollers, intermediate rollers for selectively drivingly connecting said driving means to said load carrying rollers, each of said intermediate rollers being associated with a respective one of said load carrying rollers, said load carrying rollers and said intermediate rollers being combined to form groups of rollers, means for mounting each of said intermediate rollers for individual movement between a driving position and an idling position, feeler means associated with each of said groups of rollers and responsive to the conveyed articles for controlling the positioning of said intermediate rollers of each of said groups of rollers, and adjusting means connected between said feller means and said intermediate rollers of each of said groups for adjusting the position of said intermediate rollers between said driving position and said idling position and for permitting limited movement of said intermediate rollers in radial directions in response to said feeler means, said adjusting means comprises individual links connecting adjacent intermediate rollers of said groups of rollers.

3,905,471
SHRIMP DRY FEEDER MECHANISM

Fernand S. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed June 11, 1973, Ser. No. 368,842

Int. Cl. B65g *15/00*

U.S. Cl. 198—161 **1 Claim**

1. For use with a shrimp feed tank a bulk dry shrimp feed mechanism comprising

a. an endless conveyor frame supporting an endless conveyor thereon adapted to be pivoted to the feed tank at its forward end,

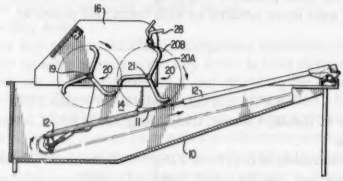
b. a shrimp metering frame carried by said conveyor frame and spaced above said conveyor,

c. a first shaft carried by said shrimp metering frame and spaced above said conveyor, and journaled for rotation in said metering frame at a fixed distance from said conveyor frame,

d. a second shaft carried by said metering frame mounted for movement toward and away from said conveyor,

e. dry feed tines carried by said first and second shafts spaced along said shafts across the width of said feed tank, said tines having curved ends curved in the direction opposite to the direction of rotation of said shafts and travel of said endless conveyor,

f. drive means for rotating said shafts and tines relative to said conveyor to regulate the amount of shrimp distributed on said endless conveyor,



g. a rockably mounted adjustment shaft journaled in said metering frame positioned above said tine shaft, and

h. a bell crank arm secured for rotation with said adjustment shaft at one end and the bearings for said second tine shaft at the other end so that upon rotation of the adjustment shaft said second tine shaft and its tines will be moved toward and away from said conveyor to regulate the feed rate of shrimp upon said conveyor.

3,905,472
CONVEYING APPARATUS FOR HEAT TREATMENT FURNACES

Rolf Schuster, Hanau, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Nov. 20, 1973, Ser. No. 417,598

Claims priority, application Germany, Dec. 4, 1972, 2259300

Int. Cl.[2] B65G *23/00*

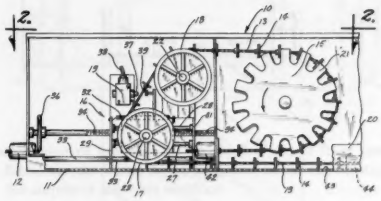
U.S. Cl. 198—203 **3 Claims**

1. Conveying apparatus for conveyance of conveyor belts, wire link straps, conveyor boxes or the like in a heat treatment furnace, comprising a pair of similar cylindrical rollers defining a single conveying path, means mounting said rollers in generally longitudinally coextensive relation for rotation about axes disposed within a generally horizontal plane in converging relationship with respect to one another in the direction of the conveying path at an acute angle in the range of magnitude of 1° to 15°, the axes of rotation of each roller being coexistent with the axis of the cylindrical form thereof, means for simultaneously rotating said rollers about their axes of rotation in opposite directions so that their upper peripheries move with lateral components of movement which are equal and in opposite directions and longitudinal components of movement which are both in the same direction, and both of endless flexible means encircling both of said rollers including an upper flight engaging the upper periphery of said rollers and a return flight below said rollers and means for pressing said return flight upwardly against the lower periphery of said rollers.

3,905,473
DRIVE APPARATUS

Robert D. Jones, and Jerry L. Hall, both of Oskaloosa, Iowa, assignors to Intraco, Inc., Oskaloosa, Iowa

Filed Jan. 21, 1974, Ser. No. 434,768
Int. Cl.² B65G *15/30*
U.S. Cl. 198—208 **12 Claims**



1. A conveyor system having a tube, a continuous cable disposed in the tube, members spaced along and rigidly affixed to said cable, drive means for moving said cable and said members along the inside of said tube, and means for tightening the cable, said means for tightening the cable comprising:
a housing;
a mounting bracket;
means for adjusting the position of said mounting bracket with respect to said housing;
at least one bar connected to said mounting bracket;
a pulley mounting member slideably connected to said bar;
a pulley rotatably mounted on said pulley mounting member and having a portion of the cable around one side thereof and exerting a force against the pulley in one direction; and
biasing means connecting said pulley mounting member to said mounting bracket to thereby exert a force opposed to the force exerted by the cable.

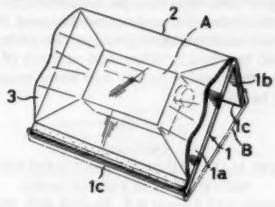
12. A conveyor system having a tube, a continuous cable disposed in the tube, members spaced along and affixed to said cable, a housing, drive apparatus connected to the housing for moving said cable and said members inside said tube, and means for tightening the cable, said means for tightening the cable comprising:
a pulley means mounted to and slidably received on a mounting bracket, said pulley means having a portion of the cable disposed around one side thereof, said cable exerting a force against the pulley in one direction;
biasing means operably connected between said mounting bracket and said pulley means to thereby exert a force in a direction opposed to the force exerted by the cable whereby the cable is kept tight;
means for adjusting the position of said mounting bracket with respect to said housing to thereby selectively tighten or loosen said cable, and
means attached to said mounting bracket for shutting off said drive apparatus when said cable becomes too loose.

3,905,474
PACKING DEVICE

Kenichiro Haibara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,425
Claims priority, application Japan, Sept. 6, 1972, 47-104195[U]
Int. Cl.² B65D *65/16, 75/42, 85/62*
U.S. Cl. 206—45.33 **6 Claims**

1. A packing device comprising a base sheet having top and bottom surfaces, a plastic film disposed in overlying relation with respect to said top surface of the base sheet and fixed to the latter at least at opposite end portions thereof, at least one fold line formed on said base sheet to divide said base sheet into at least two portions in such manner that one of said portions of the base sheet can be folded both upward toward said top surface and downward toward said bottom surface, whereby an article can be inserted into a space formed between said base sheet and said film when said one portion is folded upward and said article can be held between said base

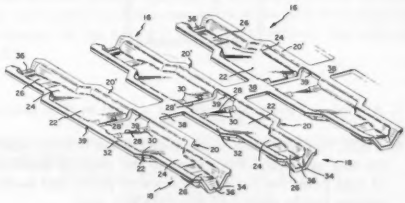


sheet and said film by the tension of said film when said one portion is folded downward, and at least two slits formed in said base sheet and intersecting with said fold line substantially at right angles to define at least two upstanding portions of said base sheet contacting side portions of said article when said one portion of said base sheet is folded downward.

3,905,475
BIVALVE HOUSING FOR ELECTRICAL TERMINAL

James Pritulsky, Harrisburg; Charles Edward Reynolds, Camp Hill, and Joseph Agusta Wise, Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 255,666, May 22, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,745
Int. Cl. B65d *73/02*
U.S. Cl. 206—330 **3 Claims**



1. A continuous plastic strip of unassembled housings, each of said housings being adapted to be assembled to an electrical contact terminal which is crimped onto one end of a wire, said terminal being of the type comprising a relatively wide contact portion and having a crimp portion integral with, and extending centrally from, said contact portion at one end thereof, said strip comprising:
a plurality of individual housings in side-by-side relationship, said housings being spaced apart along the length of said strip, each of said housings comprising a complementary pair of housing sections, said sections being substantially identical and being arranged in opposed relationship with the proximate sides of said housings being spaced-apart in the direction of the width of said strip,
each of said sections having a relatively wide portion with a central recess therein for reception of said contact portion of said terminal, said wide portions being proximate to each other and including said proximate ends,
each of said sections including a narrow portion extending laterally of the length of said strip, said narrow portions being adapted to receive said wire,
flanges extending from said wide and narrow portions in the plane of said strip, said flanges being against each other and providing bonding surface when said sections are assembled, and

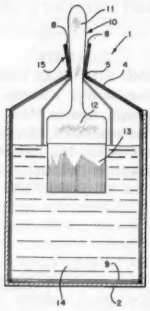
each of said housings being connected to the next adjacent housings by integral hinge means, each hinge means being connected to each of said proximate sides of both of said housing sections of two adjacent housings in said strip and being entirely between said two adjacent housings, said hinge means being foldable along a fold line

extending in the direction of said strip, whereby, the leading housing of said strip can be assembled to one of said terminals by locating said terminal in said depression of one of said sections, closing said sections, bivalve fashion, onto said terminal, bonding said surfaces of said flanges to each other, and servering said hinge means from said leading housing.

3,905,476
LINER FOR MAINTAINING PAINT AND BRUSH AND METHOD FOR USING SAME

Lester Foreman, 115 Laurel Rd., Sharon Hill, Pa. 19079

Filed Sept. 3, 1974, Ser. No. 502,291
Int. Cl.[2] A46B *17/02*; **B65D** *5/60*
U.S. Cl. 206—361 **9 Claims**



1. A liner and frame assembly for a paint bucket, comprising;

1. a thin, flexible, sheet liner closed at the bottom, open at the top, generally conforming to the internal dimensions of said paint bucket in a horizontal plane and having a greater height than said paint bucket, and

2. a frame, positioned inside said liner, said frame comprising a base positioned at the bottom of said liner and holding said liner bottom expanded, and a plurality of uprights, each upright affixed at one end thereof to said frame base and having a greater height than said paint bucket, said uprights being stiff and holding said liner expanded, and said uprights also being hand deformable, whereby said liner and said uprights may be hand deformed near the tops thereof to contact a paint brush handle and at least partially seal the contents of said paint bucket.

9. The method of maintaining paint in a paint bucket and a paint brush having a handle and bristles, during an interruption in painting, comprising;

positioning said paint brush vertically with said bristles down and said bristles in said paint, approximately centered over said paint in said paint bucket,

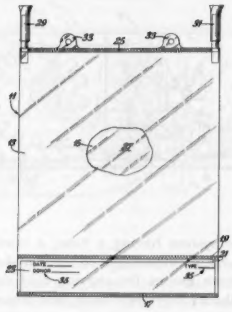
hand deforming a plurality of stiff uprights and a thin flexible sheet liner extending above said paint bucket so that said uprights and said liner contact said handle of said paint brush to form a neck around said handle,

wrapping a stiff and hand deformable tie around said liner and said uprights at said neck, whereby said paint brush is maintained in said position by said uprights and said tie, and said paint is at least partially sealed by said liner contacting said paint brush handle.

3,905,477
TAMPERPROOF POUCH LABEL

John Robert Graham, Flossmoor, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 234,634, May 14, 1972, abandoned. This application June 28, 1974, Ser. No. 484,249
Int. Cl. B65d *31/12*
U.S. Cl. 206—459 **7 Claims**



1. A pouch for packaging viable perishable materials comprising, in combination,

a. a section of tubular transparent plastic film flattened to define two substantially planar parallel side walls,

b. a first linear seal extending transversely of the side walls and sealing them to each other interiorly of the pouch,

c. a second linear seal extending substantially parallel to the first seal transversely of the side walls and sealing them to each other interiorly of the pouch at one end of the section to form a bottom closure and to define a sealed label compartment intermediate the bottom closure and the unclosed end of the section between said first linear seal and said second linear seal and an open ended fillable compartment contiguous to said sealed label compartment and

d. a label disposed in the sealed label compartment, said label having a pressure sensitive surface to produce indicia discernible through the film contiguous thereto in response to marking pressures applied thereto through the film exteriorly of the pouch.

3,905,478
CONTAINER CONSTRUCTION AND END PANEL THEREFOR

Dale S. Peterson; Onick M. Vartikian, both of Fresno, and Anthony J. Fieri, Rolling Hills Estates, all of Calif., assignors to American Forest Products Corporation, San Francisco, Calif.

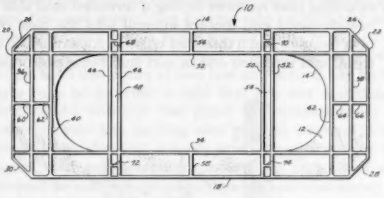
Continuation-in-part of Ser. No. 267,059, June 28, 1972, Pat. No. 3,845,861. This application Mar. 26, 1973, Ser. No. 344,807
Int. Cl.[2] B65D *81/04*, *85/34*
U.S. Cl. 206—523 **7 Claims**

1. In a container having top, bottom and side panels; a pair of end panels each comprising a molded frame of high density plastic material, said frame including a face panel and top, bottom and side rim sections attached around the periphery of said face panel and of a depth equal to the desired thickness of said end panel;

a reinforcing rib member spaced inwardly from each of said top, bottom and side rim sections and attached to said face panel, each of said rib members being at a depth of at least over half the thickness of said end panel;

at least one reinforcing cross member of a depth substantially equal to the thickness of said end panel extending between said top and bottom rim sections and spaced a

significant distance from said rim sections; the depth of said reinforcing rib members which are parallel to said top and bottom rim sections is less than the depth of said rim sections over at least a substantial portion of their length;



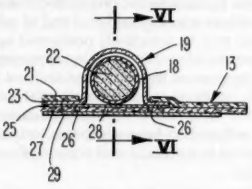
and a layer of low density, expanded plastic filler material fused to said frame and filling said frame substantially to the depth of said rim sections.

3,905,479

PACKAGING

Daniel F. Gerner, Blackwood, N.J., and Richard S. Sauter, Laverock, Pa., assignors to Packaging Coordinators Inc., Philadelphia, Pa.

Filed Mar. 28, 1974, Ser. No. 455,616
Int. Cl.² B65D *75/42, 75/46, 83/04*
U.S. Cl. 206—531 **20 Claims**



1. In a package having discrete article enclosures, such as a blister card for medicaments or the like in capsule, lozenge, or pill form, the improvement comprising a first strip having a blister-like protrusion formed therein outward from one face and leaving a corresponding hollow and an opening thereinto at the opposite face thereof, a relatively rupturable second strip adherent to the latter face of the first and sealing the opening, a supporting card including a first layer of material juxtaposed to the first face of the first strip and having an opening therein to accommodate the protrusion and including a second layer of material juxtaposed to the first layer and overlying the second strip, the second layer having a perforated access tab in the part thereof opposite the corresponding hollow opening, and a solid film backing overlying and adherent to the perforated part of the second layer and peelable therefrom.

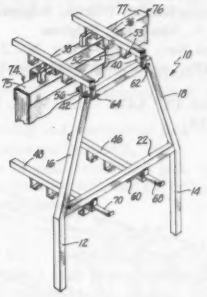
3,905,480

SUPPORTING RACK FOR SHEET MATERIALS PARTICULARLY CARPET SAMPLES

Anthony Grinceri, 626 W. "J" St., Ontario, Calif. 91762

Filed Oct. 1, 1973, Ser. No. 402,150
Int. Cl.² A47F *7/16*
U.S. Cl. 211—45 **2 Claims**

1. A supporting rack for supporting groups of samples of sheet materials assembled in books, each book having a supporting handle midway along its bound edge including a hand grip extending lengthwise of said edge, comprising in combination, a supporting frame structure having a pair of parallel support rails at the same level in the rack, a series of uniformly spaced supporting hooks carried by each of the said rails for supporting said books by their handles, each hook having an upper shank portion depending from the under side of the respective rail and a lower hook portion extending laterally of said shank portion and lengthwise of the respective rail and then upwardly toward the respective rail in a plane containing said shank portion and the respective rail, whereby each book handle is engageable with and disengageable from a hook by movement of the handle longitudinally of the respective rail, the hooks of each rail being staggered longitudinally of said rails with respect to hooks of the other rail, whereby sample



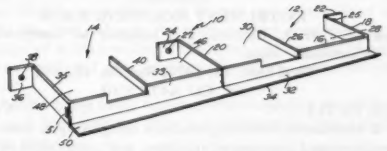
books supported by the hooks on one rail are offset both lengthwise and laterally of said rails relative to sample books supported by the hooks on the other rail, and the spacing between adjacent hooks on each rail being such that any selected book on either rail may be removed without removing the adjacent books on the other rail by initial upward movement of the selected book toward and lateral movement of the selected book lengthwise of the respective rail to disengage its handle from the respective hook and final edgewise movement of the selected book from between the adjacent books.

3,905,481

SKI STORAGE RACK

Salvatore Laterra, Providence, R.I., assignor to Norman Hines, South Attleboro, Mass., a part interest

Filed Dec. 17, 1973, Ser. No. 425,679
Int. Cl.² E05B *73/00*
U.S. Cl. 211—60 SK **4 Claims**



1. A ski rack for storing skis in a substantially upright position, comprising at least one bracket that is formed in a unitary construction and that includes an elongated front member, an end member joined to said front member at an end thereof and extending rearwardly at right angles thereto, the rearmost portion of said end member being attachable to a vertical surface for mounting the bracket thereon, an intermediate divider element formed as an integral part of said front member and cut-out therefrom, said cut-out divider element being bent at right angles to said front member and extending rearwardly thereto to define a notch in said front member, said divider element cooperating with said front member and said end member to define separate, adjacent spaces in each of which a ski is receivable for storing in the substantially

upright position thereof, at least one additional bracket mounted on said vertical surface in spaced vertical relation with respect to the first named bracket and cooperating therewith to store the skis in the substantially upright position and, a forwardly projecting shelf joined to the front member of at least the lowermost positioned of the brackets and extending substantially the full length of the front member of said lowermost bracket, said shelf receiving the butt end of said skis thereon for storing said skis in an elevated upright position.

3,905,482

CASING FOR HOLDING SAMPLE TUBES

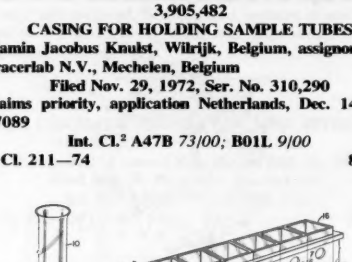
Benjamin Jacobus Knulst, Wilrijk, Belgium, assignor to ICN Tracerlab N.V., Mechelen, Belgium

Filed Nov. 29, 1972, Ser. No. 310,290

Claims priority, application Netherlands, Dec. 14, 1971, 7117089

Int. Cl.[2] A47B *73/00;* **B01L** *9/00*

U.S. Cl. 211—74 **8 Claims**



1. Apparatus for holding sample tubes comprising a casing defining a plurality of compartments for the reception of sample tubes, means for holding tubes in said compartments, each compartment having a front wall, each said front wall having two openings formed therein said openings lying one above the other, and removable coding members insertable into said compartments, said coding members having in one face, two openings registrable with the two openings in said front walls of the compartments, in another face, an opening registrable with the lower opening in said front wall, in a further face, an opening registrable with the upper opening in said front wall and in a fourth face, no opening.

3,905,483

INSTRUMENT MOUNTING RACK

Ian M. Patrick, Hatboro, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 18, 1974, Ser. No. 452,992

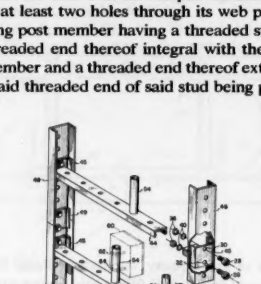
Int. Cl.[2] A47F *5/10*

U.S. Cl. 211—177 **6 Claims**

6. Instrument mounting structure comprising an assembly of prefabricated component members, said component members being readily assembled in any of a plurality of structural configurations, said component members including at least one upright support member formed of channel shaped cross-section, having a plurality of relatively unformly spaced holes in the web portion of said channel, and a foot portion integral with each one of said support members;

horizontal beam members, that are each of an inverted channel shaped cross-section, end cap members that are each of a channel shaped cross-section, one of said end cap members being integral with and surrounding each end of said beam member and having a plurality of holes extending through each of their web portions, said holes in said cap members being adapted for alignment with selected ones of the holes in the web of said upright support member whereby the ends of said horizontal members are of a dimension to be selectively positioned and attached to said upright support member at a position within the opposing flanges of said lastmentioned member, each of said channel shaped horizontal members having at least two holes through its web portion; and

a mounting post member having a threaded stud that has a non-threaded end thereof integral with the base of said post member and a threaded end thereof extending therefrom, said threaded end of said stud being positioned for



insertion in any selected one of said holes in said horizontal members whereby said stud end of said mounting post member may be selectively positioned against the web of said horizontal member and in supporting surface-to-surface engagement therewith and secured in said last-mentioned position to said horizontal member by said threaded stud and a nut, said mounting post member being adapted to have a process instrument detachably connected to a vertical wall portion of said mounting post member.

3,905,484

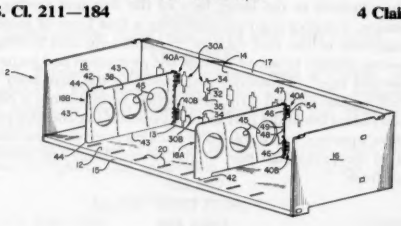
FLEXIBLE DIVIDERS FOR LATERAL SHELF FILING

Carl J. Dean, Charlton; David M. Wright, Shrewsbury, and Bernard T. Cournoyer, Holden, all of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Aug. 20, 1973, Ser. No. 389,887

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—184 **4 Claims**



1. A shelving assembly adapted for lateral filing purposes comprising:

a base panel;

a rear panel extending at substantially a right angle to said base panel;

at least one restraining slot formed in said base panel and spaced from said rear panel a first predetermined distance;

first and second aligned key slots formed in said rear panel, one of said key slots being spaced from said base panel a second predetermined distance, and the other of said key

slots being spaced from said one key slot a third predetermined distance; and

a flexible, resilient, substantially planar divider having a front edge, a rear edge, and longitudinally extending top and bottom edges, a restraining tab on said bottom edge and first and second key locking tabs on said rear edge; said key locking tabs being spaced with respect to one another and also with respect to said top and bottom edges such that either of said first and second key locking tabs may be inserted in said first key slot and slidably interlocked with said rear panel and simultaneously the other of said key locking tabs may be inserted in said second key slot and slidably interlocked with said rear panel, and said restraining tab being so located with respect to said bottom edge that (a) said restraining tab is aligned with and extends into said restraining slot so as to restrain a portion of said divider against lateral movement relative to said base panel when said first and second key tabs are inserted in said first and second key slots respectively, and (b) said restraining tab is aligned with but faces away from said restraining slot when said first and second key tabs are inserted in said second and first key slots respectively; and

said first and second key locking tabs extending through said key slots and being slidably interlocked with said rear panel.

3. A flexible shelf divider comprising:

a flexible substantially planar body having a front edge, a rear edge, and upper and lower edges;

a first pair of flange sections formed integral with opposite sides of said body along a first portion of said rear edge; a second pair of flange sections formed integral with opposite sides of said body along a second portion of said rear edge;

each of said flange sections having a flat surface that extends lengthwise of said rear edge and at a right angle to the plane of said body, said flat surfaces all being co-planar with one another; and

a pair of mutully spaced locking tabs formed integral with said body at said first and second portions of said rear edge;

each of said tabs comprising a flat body portion that is coplanar with said flat body and a pair of ears on opposite sides of said body portion, each of said body portions having upper and lower edges and an end edge, each of said ears having upper and lower surfaces that terminate short of the upper and lower edges of said tab body portion and a flat end surface that extends between said upper and lower surfaces at substantially a right angle to said body portion and in confronting relation with the said flat surface of one of said flange sections, the end surface of each ear and the confronting flat surface of the adjacent flange section being spaced from one another so as to form a groove therebetween.

3,905,485
ROLL CHANGING DEVICE FOR A ROLLING MILL AND THE LIKE

Charles Storer Shumaker, Glenshaw, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,423
Int. Cl.² B66F *9/04*
U.S. Cl. 214—1 D **3 Claims**

1. An apparatus for removing and replacing a roll to and from a rolling mill or the like, comprising:

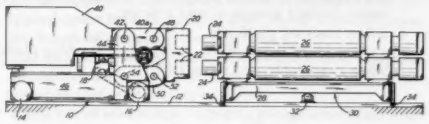
a car arranged on the operator's side of said mill, said car including a member at its end adjacent to the mill for cantileverly supporting a roll in a position parallel to its working position when the roll is in said mill,

said car including a counterweight arranged to offset at least a part of the weight of said roll when supported by said member,

means for pivotally supporting said counterweight,

linkage means for connecting said counterweight to said member in order that vertical movement of said counterweight is translated to said member,

means for effecting said vertical movement of said counterweight comprising a piston cylinder assembly,



means for restricting the upper movement of said counterweight comprising a mechanical jack having a stop means,

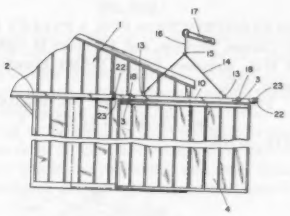
means for mounting said mechanical jack on said counterweight for movement therewith, and

said stop means of said mechanical jack constructed and arranged for contacting with said car on said upper movement of said counterweight.

3,905,486
DOOR LIFTING AND POSITIONING MEANS

Billie Lee Genson, Spencer, Iowa, assignor to Morton Buildings, Inc., Morton, Ill.

Filed Jan. 17, 1974, Ser. No. 434,049
Int. Cl.² E04G *21/14*
U.S. Cl. 214—1 H **8 Claims**



1. Apparatus for lifting and positioning a laterally movable door with the trolley assemblies from which the door is suspended in a fixed track already mounted on a building over an opening therein and wherein a tractor boom is utilized in handling the door, wherein the improvement comprises:

a hanger of a cross-sectional shape the same as that of said fixed track and of a length exceeding the width of said door,

said hanger being easily engaged with the trolley assemblies of said door with the door in a substantially prone position, and

lifting means connected to said hanger and which may be connected to said boom, whereby said door may be raised to a vertical position and said hanger disposed into end-to-end abutment with said fixed track for lateral movement of the door from the hanger to the fixed track.

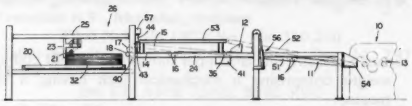
3,905,487
CONTINUOUS STACKING APPARATUS

Kenneth E. Hoke, and Gerald D. Haynes, both of Marion, Ind., assignors to Greene Line Manufacturing Corporation, Marion, Ind.

Filed Mar. 4, 1974, Ser. No. 447,862
Int. Cl.² B65G *57/112*
U.S. Cl. 214—6 H **13 Claims**

1. A continuous stacking apparatus comprising:

a. conveyor means for moving shingled articles from a cutter to a stacker, said conveyor means including a pivotal conveyor for moving said shingled articles, said pivotal conveyor being pivotal in the vertical plane;
b. gap creating means extending at least partially over and across said conveyor means and being engageable with and operable to create gaps in said shingled articles providing distinct groups of said articles;
c. a first stacking platform;
d. a second stacking platform, said second stacking platform being extendable and retractable;



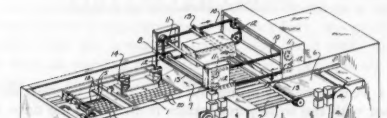
e. sensing means positioned adjacent said conveyor means and being operable to sense said gaps when said gaps pass said sensing means;
f. drive means connected to said second stacking platform and operable upon command from said sensing means to cause said second stacking platform to extend to the stacking position;
g. lifting means connected to said pivotal conveyor and operable to lift said pivotal conveyor upon command from said sensing means; and
h. lowering means connected to said first platform operable to lower said first platform.

3,905,488

APRON CONSTRUCTION FOR A PALLET LOADER

Robert M. Larson, Mequon, and Theodore D. Gabos, Grafton, both of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Mar. 29, 1974, Ser. No. 456,037
Int. Cl.² B65G *57/03*
U.S. Cl. 214—6 DK **11 Claims**



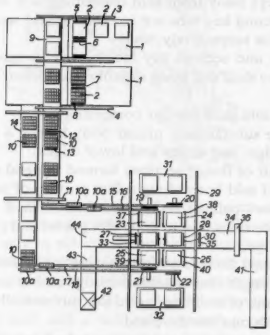
1. In a pallet loader, an apron assembly disposed to be moved between a generally horizontal supporting position in which the apron assembly supports a series of articles and a generally vertical non-supporting position, whereby the articles are deposited onto a pallet located beneath the horizontal position of the apron assembly, a series of generally parallel elongated elements extending transversely to the direction of movement of said apron assembly, a drive member connected to the respective ends of the elements, drive means to drive the drive member in a reciprocating path to thereby move the apron assembly between the supporting and non-supporting positions, and a series of plastic blocks each engaged with a pair of adjacent elements, each block having a length substantially less than the length of said elements whereby a series of blocks are engaged with each pair of adjacent elements, said blocks being arranged with respect to said elements so that the joints between blocks which extend in a direction longitudinally of the elements are staggered, said blocks are formed of two mating sections, each section having a pair of generally parallel recesses disposed to engage the pair of adjacent elements.

3,905,489

STACKING OF BRICKS

Walter Berndt, Laggenbeck, Germany, and Helmut F. Lauff, Furlong, Pa., assignors to C. Keller & Co., Laggenbeck, Germany

Filed Apr. 19, 1974, Ser. No. 462,513
Claims priority, application Germany, Oct. 26, 1973, 2353753
Int. Cl. B65g *57/24*
U.S. Cl. 214—6 A **3 Claims**



1. A device for forming stacks of bricks of uniform shade, said device comprising
first transport means,
second transport means parallel to the first transport means, means operative to transfer layers of bricks from a kiln trolley onto the first transport means and to transfer some of said bricks on said first transport means onto said second transport means,
a first pair of conveyors arranged at the downstream end portion of the first transport means and extending transversely thereto whereby each of said conveyors receives a row of bricks from the first transport means,
a second pair of conveyors arranged at the downstream end portion of the second transport means and extending transversely thereto whereby each of said conveyors receives a row of bricks from the second transport means,
a plurality of second transfer means each associated with a respective one of the conveyors,
a plurality of collecting tables associated with the second transfer means, the second transfer means being operative to transfer rows of bricks from the associated conveyor onto a said collecting table whereby a re-arranged layer is formed on the collecting table,
a lowerable stacking table positioned to receive layers of bricks from the collecting tables whereby a stack is formed on the stacking table,
storage tables associated with the collecting tables, and
pivotal gripper means operative to transfer layers of bricks from the collecting tables to the storage tables when the bricks on the collecting tables are of a different shade to those on the stacking table, and to transfer layers of bricks from the storage tables to the stacking table to be intermixed with the bricks thereon when the shade of the bricks on the storage tables is the same as that on the stacking table.

3,905,490

CASE-MAKING MACHINERY

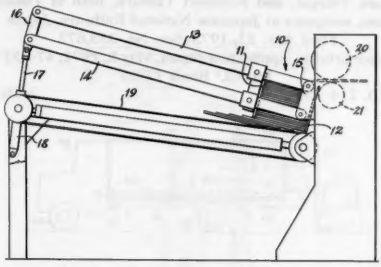
Frederick Paul Johnson, Audenshaw, England, assignor to Henry Simon Limited, Cheshire, England

Continuation of Ser. No. 257,139, May 26, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,882

Claims priority, application United Kingdom, June 26, 1971, 30048/71

Int. Cl. B65g *60/00, 59/06*

U.S. Cl. 214—6 D **9 Claims**



1. A machine for receiving formed but collapsed cases, forming same into a squared stack and delivering them from the stack in shingled configuration, comprising a stack retaining means into which cases are successively delivered, means for spanking at least one side of the stack to square the cases within the stack, means for feeding cases from the under side of the stack, the relative positions of the stack retaining means and said feeding means being adjustable such that in use said feeding means is caused to engage each case and feed same from the stack before at least the immediately preceding case has cleared the confines of the stack retaining means, whereby the cases are fed from the stack in shingled configuration, said stack retaining means comprising a hopper having front and rear walls respectively arranged in substantially parallel spaced relationship above said feeding means, the lower edge of said front wall being adjustable in height relative to said feeding means thus to form a gate therebetween through which cases may issue in shingled configuration, the adjustment of said front wall being effected by tilting said hopper and the cases contained therein relative to said feeding means, said front wall of said hopper being mounted on arms extending away from said rear wall, and said front wall being movable along said arms thus to vary the front to rear dimension of said hopper and so accommodate different sizes of cases, and means whereby said arms are pivotally connected to a fixed frame portion adjacent said rear wall and to power means for raising and lowering said arms thus to tilt said hopper.

3,905,491

CONVEYOR LOADING AND CODING SYSTEM

John Harrison, Lincolnwood, Ill., assignor to The Spra-Con Company, Chicago, Ill.

Division of Ser. No. 266,320, June 26, 1972, abandoned, which is a continuation of Ser. No. 45,174, June 9, 1970, abandoned. This application Oct. 4, 1973, Ser. No. 403,480

Int. Cl. B65g *43/00*

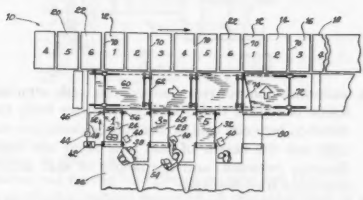
U.S. Cl. 214—11 R **3 Claims**

1. In a system for loading articles on a conveyor wherein the conveyor comprises a plurality of separate, individually defined, article carrying areas, a plurality of loading stations, at least two article transfer means defining separate supporting surfaces means mounting said article transfer means in a substantially parallel relationship with said conveyor, each of said article transfer means being positioned for receiving articles from two or more loading stations, the transfer means including article engaging means defining article engaging surfaces, said loading stations providing means for inserting articles in front of the article engaging means, means for driving said conveyor and said article engaging means, said transfer means operating to move articles onto the conveyor, and a transfer location for each transfer means at which the articles are moved from the transfer means onto said conveyor,

a. the improvement wherein the article engaging means are spaced apart by a distance at least equal to about twice the length of an article carrying area,

b. said means for driving the conveyor and article engaging means moving said article engaging means at the same speed as said article carrying areas,

c. a first set of said article engaging means associated with a first transfer means, each article engaging surface in said first set being spaced from the transfer location of the first transfer means at the time of engagement with an article, a distance substantially equal to the distance from the transfer location, at that same time, of an article receiving position on a specific article carrying area, each said specific article carrying area alternating with other article carrying areas,



d. and at least one additional set of article engaging means associated with a separate transfer means, each article engaging surface of said additional set being spaced from the transfer location of the separate transfer means, at the time of engagement with an article, a distance substantially equal to the distance from the transfer location, at that same time, of an article receiving position on one of said other article carrying areas, said other article carrying areas being positioned between said specific article carrying areas,

e. whereby articles engaged by the first set of article engaging means can only be transferred to said specific article carrying areas, and articles engaged by said additional set of article engaging means can only be transferred to said other article carrying areas positioned between said specific article carrying areas, and

f. including a coding means associated with each loading station, said coding means being provided for applying a code to each article before the article is placed on said transfer means, and means for maintaining the code in association with the article during carrying of the article by the conveyor.

3,905,492

MULTI-RACK STACKER SYSTEM WITH A CONVEYOR AND TRANSVERSER

Kazuo Maeda, and Masakatsu Tsubokawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Kito, Kawasaki, Japan

Filed June 29, 1973, Ser. No. 374,843

Claims priority, application Japan, July 1, 1972, 47-65409; July 3, 1972, 47-65884; July 4, 1972, 47-66314

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 B **7 Claims**

1. A stacker system including a number of multi-rack stacker shelves extending in parallel with each other defining therebetween accumulation conveyor paths, comprising:

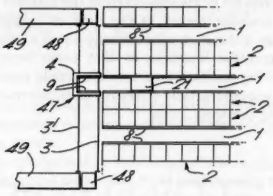
a. an accumulation conveyor, having a lower frame; vertical frame members upstandingly affixed to said lower frame, the upper ends of said vertical frame members being opened without being connected to each other and ex-

tending upwardly beyond the uppermost surface of said stacker shelves; a carriage located between said vertical frame members for raising and lowering a load; and means to raise and lower said carriage with respect to said vertical frame members;

b. accumulation conveyor traveling rails located on both sides of said accumulation conveyor paths;

c. traverser traveling rails located along the ends of said stacker shelves arranged in a direction transverse to said accumulation conveyor paths;

d. a traverser body adapted to move along said traverser traveling rails, having a generally U-shaped frame opening towards said accumulation conveyor paths;



e. accumulation conveyor supporting rails attached to the inside of legs of the U-shaped traverser body frame, the distance between said accumulation conveyor supporting rails and the height of said rails being the same as the distance between, and the height of said accumulation conveyor traveling rails;

f. means to move said traverser body along said traverser traveling rails; and

g. means to move said accumulation conveyor along said accumulation conveyor supporting rails and said accumulation conveyor traveling rails.

3,905,493

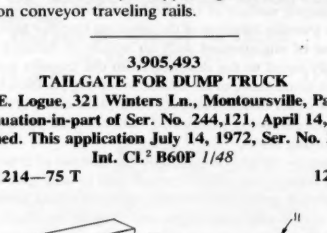
TAILGATE FOR DUMP TRUCK

George E. Logue, 321 Winters Ln., Montoursville, Pa. 17754

Continuation-in-part of Ser. No. 244,121, April 14, 1972, abandoned. This application July 14, 1972, Ser. No. 272,025

Int. Cl.[2] B60P *1/48*

U.S. Cl. 214—75 T **12 Claims**



1. A combined tailgate and hoist for a vehicle dump box comprising an end panel spanning the open rear end of said box, two side members secured to said end panel to form a composite U-shaped tailgate, said end panel being connected only to said side members, reinforcement means on the side members and end panel of said tailgate to render the same capable of supporting relatively heavy lifted loads suspended therefrom, means for pivotally mounting said side members along the sides and adjacent the top of said box, the length of said side members being such that arc movement of the tailgate is sufficient for the end panel to move upwardly a distance at least substantially equal to the distance from the bottom of the box to the ground and longitudinally at least substantially to the midpoint of the box, hoist means on said tailgate for supporting a load, and power means independent of the dumping action for pivoting said composite tailgate to open and close the rear end of the box and to transfer through said hoist means a load attached to said end panel between the box and the ground.

3,905,494

LOAD SHIFTING TYPE CARGO MOVING DEVICE

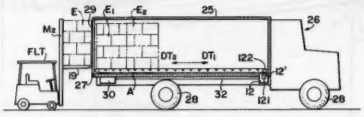
Shukuro Yatagai, and Katunori Tamura, both of Fukuoka, Japan, assignors to Japanese National Railways, Japan

Filed Apr. 23, 1973, Ser. No. 353,672

Claims priority, application Japan, May 9, 1972, 47-53277

Int. Cl.[2] B66B *17/00*

U.S. Cl. 214—89 **2 Claims**



1. A load-shifting type cargo moving device for use in conjuntion with a forklift, comprising a frame with a base on which are formed specified parallel spaces defined by a plurality of parallel projections with a plurality of conveyor means which are installed longitudinally in every other one of said spaces and is adapted for movement therein, said conveyor means being driven and operating in the same direction at the same speed by a common drive shaft with a belt on said conveyor means located at a position higher than the upper extremity of said frame, wherein the said spaces which are free of said conveyor means are for simultaneous introduction of forklift tines such that when said tines are so introduced into the said spaces, the top side of said belt is located above the upper extremity of said tines and wherein a plurality of free rollers are arranged at definite intervals in such manner that said rollers bear against the underside of the upper part of the belt stretched between a drive belt pulley and a driven belt pulley of the conveyor means and a plurality of bosses are formed on the peripheries of the drive belt pulley and the driven belt pulley of the conveyor means, a plurality of through holes matching said bosses are bored on the belt, and in the process of the conveyor means being driven by the drive belt pulley, said bosses successively enter and exit said through holes and, wherein a belt-tightness adjuster means is provided which contacts the underside of the lower part of the belt and is comprised of a tensioning wheel rotatably mounted on support arms resting on the base.

3,905,495

FRAME HANDLER WITH IMPROVED CARRIAGE ASSEMBLY

Mark Wayne, Southfield, Mich., assignor to Planet Corporation, Troy, Mich.

Filed Sept. 5, 1974, Ser. No. 503,388

Int. Cl. B65g *47/60*

U.S. Cl. 214—91 R **8 Claims**

1. A frame handler adapted to move a vehicle frame between a horizontal and a vertical position, said frame having at least two side rails and at least one cross member, said frame handler comprising:

a base;

a pair of spaced and parallel arms pivotally mounted around a horizontal axis to said base;

means to move said arms between a substantially horizontal and a substantially vertical position;

side guide means secured to said arms near the upper end of each of said arms when said arms are in a vertical position, said side guide means adapted to engage the side

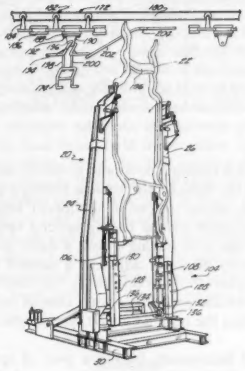
rails of said frame in a sliding engagement therewith; and

a carriage assembly comprising:

a first and a second carriage respectively secured to each of said arms at a position spaced from said guide means along said arms, wherein said carriages are slidably mounted towards said guide means;

means to move said carriages along said frame handler arms;

at least two carriage arms secured to each of said carriages, said carriage arms being rotatably mounted around a vertical axis when said frame handler arms are



in a vertical position, wherein said carriage arms are adapted to swing into the interior of said frame to engage at least one of said cross members of said frames; and means to rotate said arms.

7. The invention as defined in claim 1 and including a hook conveyor, said hook conveyor having a plurality of spaced and downwardly extending hooks, wherein each of said hooks is adapted to support one of said frames by one of said frame cross members, and means to pivot said hook to a horizontal position and release said hook to a downwardly extending vertical position, when desired, to engage said frame cross member.

3,905,496

UNLOADER ELEVATOR WITH ENERGY MEANS TO RETURN THE ELEVATOR TO ITS LOADING POSITION

William Reeder, 10 Leigh Ave., Punchbowl, New South Wales, Australia

Filed Sept. 21, 1973, Ser. No. 399,730
Claims priority, application Australia, Oct. 4, 1972, 689/72
Int. Cl. B65g *47/00*
U.S. Cl. 214—128 **9 Claims**

1. Unloading apparatus comprising:

a rigid frame including spaced upright posts,

a laterally troughed load-receiver tray guided for free descent within the space between said posts from an elevated position within said space adjacent an upper portion of said frame, said tray having a load-receiving end at one side of said space and a load-departure end at the opposite side of said space, said tray including a floor and a lateral hinged flap,

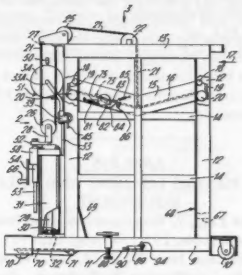
said tray being suspended by a pair of cables each having one end attached to said tray and its other end attached to said frame adjacent said upper portion thereof, each of said cables defining a pendent looped portion,

an obstruction block on one of said posts for stopping the descent of only the load-receiving end of said tray at an elevation adjacent a lower portion of said frame so that the load-departure end of said tray may descend to an elevation lower than said elevation whereby said tray is tilted for unloading, and

means for holding said flap elevated relative to the floor of said tray, and means to render said flap flush with said floor when said load-departure end of said tray descends to said lower elevation,

pneumatic means for storing sufficient energy generated by descent of said tray when loaded to return it to said elevated position within said space upon loss of its load,

said pneumatic means comprising:



a cylinder,

a piston in said cylinder,

a piston rod having said piston on one end thereof,

a pair of idler pulleys mounted on the other end of said piston rod, each idler pulley being suspended by the pendent looped portion of a respective one of said pair of cables,

a compressed air reservoir, and

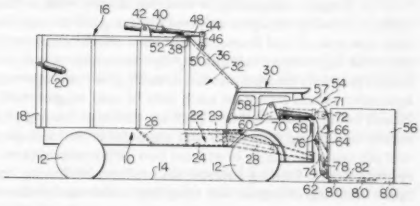
a pipe connection between one end of said cylinder and said compressed air reservoir, said pipe connection including a regulator valve through which air proceeds from said cylinder to said reservoir and a self closing valve through which air may proceed freely from said reservoir to said cylinder.

3,905,497

AUTOMATED REFUSE COLLECTION VEHICLE

Robert N. Stedman, Chillicothe, and Raymond L. Moser, Tremont, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1974, Ser. No. 528,361
Int. Cl.² B65F *3/02*
U.S. Cl. 214—302 **8 Claims**



1. A refuse collection vehicle comprising:

a wheeled vehicle;

a body on said vehicle, said body including interior refuse compacting means;

a refuse inlet on said vehicle for receiving refuse to the collected and compacted;

means associated with said inlet for delivering refuse received therein to the interior of said body for compaction therein;

a removable chute on said vehicle and superposed over said inlet, said chute having an enlarged, upper refuse receiving opening and a lower refuse discharging, said refuse discharging opening overlying said inlet whereby refuse deposited in said chute will be directed to said inlet; and moving means mounted on said vehicle for (a) gripping a refuse container resting on underlying terrain adjacent said vehicle, (b) moving the refuse container to a discharge point above said chute upper refuse receiving opening so that refuse in the container will be deposited in said chute, (c) returning the container to the underlying terrain, and alternatively (d) removing said chute from and replacing said chute on said vehicle whereby said vehicle may be selectively conditioned for collection of refuse in large containers through said chute and from small containers directly emptied into said inlet when said chute is removed.

3,905,498

WAGONS HAVING LOADING AND UNLOADING EQUIPMENT

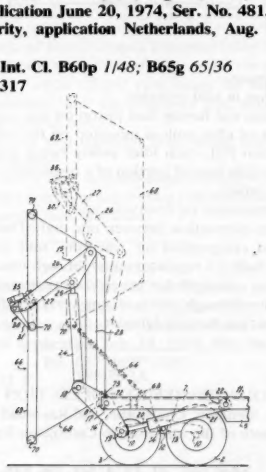
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 171,131, Aug. 12, 1971, abandoned. This application June 20, 1974, Ser. No. 481,315

Claims priority, application Netherlands, Aug. 13, 1970, 7011939

Int. Cl. B60p *1/48;* **B65g** *65/36*

U.S. Cl. 214—317 **13 Claims**



1. A wagon comprising a wheeled frame with a loading surface, loading equipment pivotally coupled to said wagon near one end of said frame, and at least one loadable receptacle, said equipment comprising hydraulically operated arm means pivotally interconnected to each other and operated by hydraulic piston means at each side of said wagon, said arm means being connected to a pick-up structure having pick-up means and being lowerable and extendable to load, pick up and tilt said receptacle in at least two different positions with respect to said loading surface, said receptacle having spaced apart securing elements and coupling members for the alternative connection to connection means on said wagon, a first connection of said connection means being connectable to said coupling members, said receptacle being tiltable relative to said loading surface in a low position adjacent said surface, a second connection of said connection means being connectable to said elements and said receptacle being tiltable in a higher position in which said receptacle is positioned substantially above said loading surface, said receptacle being movable into said tilted positions with said arm means.

3,905,499

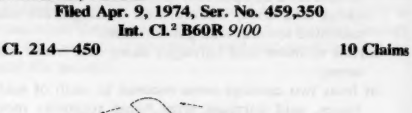
BOAT LIFTING DEVICE

Leslie Raymond Speidel, 2797 E. 48th Ave., Vancouver, British Columbia, Canada

Filed Apr. 9, 1974, Ser. No. 459,350

Int. Cl.² B60R *9/00*

U.S. Cl. 214—450 **10 Claims**



1. A device for raising a boat onto a vehicle and for lowering the boat from the vehicle, the vehicle having a generally horizontal support means spaced at a support height above the ground, the support means having spaced upper and lower rear portions; the boat having a bow, a stern, gunwales, and a centre of gravity disposed adjacent a central vertical plane extending between the bow and stern, the central plane being adapted to coincide generally with a central vertical plane of the vehicle when the boat is carried on the vehicle, the device including:

a. a hinged framework having a pair of spaced, similar, generally L-shaped side members, each L-shaped side member having:

i. a first portion having inner and outer ends, the outer end being adapted to be hinged to the lower rear portion of the support means so as to permit swinging about a horizontal hinge axis disposed transversely of the vehicle, the first portion having a length greater than spacing between the upper and lower rear portions of the support means,

ii. a second portion having inner and outer ends, the inner ends of the first and second portions being secured together at a frame corner so that the portions are inclined to each other at a frame angle, the second portion having a length greater than spacing between the stern and the centre of gravity of the boat,

the hinged framework further including:

iii. a transverse tie rod extending between the L-shaped side members so as to secure the side members together so that the first and second portion of each L-shaped side member are disposed in first and second planes respectively inclined at the frame angle so as to form an essentially rigid framework that can hinge about the hinge axis as a single unit,

iv. first and second pulleys mounted on the framework and journalled for rotation within generally vertical planes, the pulleys being positioned on the framework so that when the boat gunwales are adjacent the second members of the framework with the stern thereof adjacent the frame corner of the framework, the first pulley is positioned forward of the centre of gravity of the boat and the second pulley is positioned generally adjacent the centre of gravity of the boat,

the device further including:

b. an aligned spaced pulley pair journalled for rotation within a vertical plane at a position adjacent the upper rear portion of the vehicle support means,

c. reversible winch means secured to the vehicle,

d. a flexible tension link having inner and outer ends, the outer end adapted to be secured to the boat at a position forward of the centre of gravity thereof, the inner end cooperating with the winch, the link passing from the

boat over the first pulley, around the second pulley and between the pulley pair to the winch means,

e. hinge means adapted to be secured to the stern of the boat and to cooperate releasably with the tie rod at the frame corner of the framework to permit swinging of the boat thereabouts,

f. boat engaging means on the second portions of the frame member to engage the boat when the gunwales are adjacent the second portions to reduce movement between the boat and the framework,

g. releasable means to retain the hinged framework in the raised position on the vehicle,

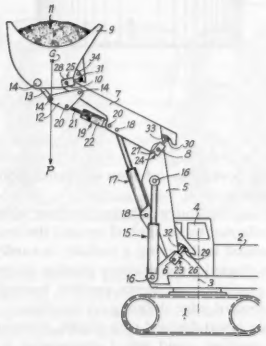
so that when the frame is in a lowered position and the boat is positioned upright with the central plane thereof generally normal to the hinge axis, the bow remote from the vehicle and the stern adjacent the frame corner with the hinge means of the boat cooperating with the tie rod of the framework, when the winch takes in the flexible link the bow of the boat is raised upwards as the boat rotates about the tie rod until the boat gunwales are brought adjacent the second portions of the framework, the boat being held thereagainst by link tension, and continued taking in of the link rotates the framework through approximately 90° about the hinge axis thereof to a fully raised position so that the boat is lifted above and forward of the upper rear portion of the supporting means, the boat simultaneously rotating about the stern thereof to assume an inverted position supported upon the vehicle, control of the boat being maintained throughout by reversal of the winch means as the boat centre of gravity passes forward of the pulley pair.

3,905,500

PUBLIC WORKS MACHINE HAVING A SAFETY DEVICE FOR THE MANOEUVRE OF ITS WORKING EQUIPMENT

Bernard M. Bourges, Le Plessis Belleville, France, assignor to Societe Anonyme: Poclain, Le Plessis Belleville, France

Filed Feb. 7, 1974, Ser. No. 440,581
Claims priority, application France, Mar. 9, 1973, 73.08621
Int. Cl.² E02F *3/86*
U.S. Cl. 214—762 **5 Claims**



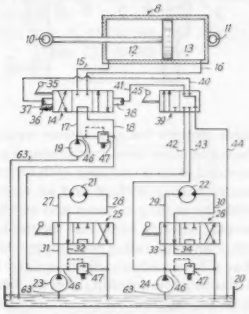
1. A loader comprising a body member; means on the body member defining a first pivot axis; a jib system mounted on said body member for pivotal movement about said first pivot axis and comprising at least one jib member; means on said jib system defining a second pivot axis; means for mounting an implement member on said jib system for pivotal movement about said second pivot axis; first fluid motor means for rotating said jib system about said first pivot axis; second fluid motor means for rotating said implement member about said second pivot axis; control valve means responsive to the relative angular positions of said members; means for applying fluid pressure to said fluid motor means; a fluid reservoir; and a discharge conduit extending from one of said fluid motor means to said reservoir via said control valve means, said control valve means being responsive to the relative angular positions of said implement with respect to said jib system about said second pivot axis and said jib member with respect to said body member about said first pivot axis to open said conduit to fluid flow when said angular positions enter predetermined ranges, whereby operation of said one of said fluid motor means to raise said implement member is inhibited.

3,905,501

CONTROL MEANS FOR PUBLIC WORKS MACHINE

Jean E. Leroux, Le Plessis-Belleville, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed Jan. 31, 1974, Ser. No. 438,378
Claims priority, application France, Feb. 9, 1973, 73.04754
Int. Cl.² E02F *3/85*
U.S. Cl. 214—762 **6 Claims**



1. A public works machine comprising:

a frame,

a set of front driving wheels to which at least one first hydraulic driving motor is coupled;

a set of rear driving wheels to which at least one rear hydraulic driving motor is coupled;

means for supplying fluid under pressure to said front and rear motors and connected thereto by respective feed pipes;

a discharge reservoir means;

working equipment articulated to said frame;

a double-acting drive member coupled between said frame and said working equipment and which comprises two chambers;

a first pipe and a second pipe connected respectively to said two chambers;

a three-position regulator comprising the sole valve means for providing work fluid for said double-acting drive member which:

in a first position connects said first pipe to said fluid supply means and said second pipe to said discharge reservoir means;

in a second position connects said first pipe to said discharge reservoir means and said second pipe to said fluid supply means;

and, in a third position blocks said first and second pipes;

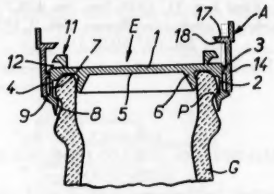
manually operable means for selecting the position of said regulator;

and, automatically operable control means for automatically positioning said regulator in accordance with the values of the torques opposing said front and rear sets of wheels and comprising a double-acting drive device having two chambers which are respectively connected to a third pipe and a fourth pipe which can be placed in communication respectively with fluids at pressure corresponding to those in said feed pipe to said front and rear motors, and a return member tending to maintain said

regulator in its third position when the effects of the pressure of fluids in said two chambers are equal and opposite.

3,905,502
STOPPER, PARTICULARLY FOR PRESSURISED CONTAINERS

Victor Wassilieff, 84 Rue de l Assomption, 75016 Paris, France
Continuation of Ser. No. 220,603, Jan. 25, 1972, abandoned. This application July 10, 1974, Ser. No. 487,141
Int. Cl. B65d *45/30*
U.S. Cl. 215—250 **15 Claims**



1. A resealable stopper for a container having a neck with a downward facing annular zone, comprising a sealing element with a skirt provided at its lower edge with an integral beading having an annular sealing surface and an operating element cooperating with the sealing element and axially displaceable in relation thereto, wherein both said elements have in relation to each other an inoperative position in which the operating element has a lower edge radially spaced from the skirt and resting in abutting relationship upon the beading whereby both elements define therebetween an annular gap immediately adjacent and above said beading, while the sealing surface is positioned under and free of sealing contact with said annular zone, and an operating position reached by thrusting said lower edge down against said beading, thereby causing the latter to pivot downwards relative to the skirt and the annular sealing surface to pivot upwards relative to the skirt and sealingly engage the annular zone.

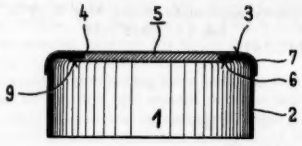
3,905,503
CONTAINER CLOSURE HAVING EASY-OPENING MEANS

Ermal C. Fraze, 355 W. Stroop Rd., Dayton, Ohio 45429
Continuation of Ser. No. 599,124, Dec. 5, 1966. This application Mar. 17, 1969, Ser. No. 808,015
Int. Cl. B65d *41/32*
U.S. Cl. 215—255 **21 Claims**

1. Container means comprising, first wall means defining a compartment and having first peripheral surface means defining large area access means therefor, pull-off wall means having second peripheral surface means corresponding in peripheral outline to said first peripheral surface means and having strip means comprising an integral part thereof, said strip means having a severable inner portion adapted to have pull means fastened thereto and an attached outer portion which remains attached to said pull-off wall means adjacent said second peripheral surface means upon severing said strip means, fastening means for fastening said wall means together by fastening said surface means together at an infinite number of independent fastening positions therealong, wherein said attached outer portion enables said strip means to be used to apply a concentrated pulling force the effect of which is to first pull a portion of said pull-off wall means free adjacent the initial position of said attached outer portion and with continued application of said pulling force said pull-off wall means is pulled free in a progressive manner at each of said fastening positions, and pull means having inner end means and fixed to said inner portion to enable easier severing of said strip means, said strip means being defined by substantially U-shaped score means arranged in said pull-off wall means with its outwardly extending legs substantially transverse to said second peripheral surface means and the strip portion between the terminal ends of said outwardly extending legs defining said attached outer portion.

3,905,504
CLOSURE CAP FOR INFUSION OR TRANSFUSION FLASKS

Reinhard Stadler, Karlsruhe, Germany, assignor to Futurinvest AG, Lucerne, Switzerland
Filed Oct. 3, 1973, Ser. No. 403,072
Int. Cl.[2] B65D *41/62*
U.S. Cl. 215—316 **2 Claims**



1. A sealing device for infusion or transfusion flasks, said device comprising:

a metallic cap having a tubular portion with a first end thereof adapted to be applied around the neck of a flask, and a second end having a radially inwardly extending, flat, disk-shaped annular cover portion integral with said tubular portion, said cover portion having an annular radially inward edge defining an aperture;

a removable insert formed of a plastic material positioned in said aperture, said insert comprising a cup-shaped closure portion, a plurality of tongue-shaped portions extending parallel to said closure portion, and a U-shaped annular groove separating said closure portion and said tongue-shaped portions;

said U-shaped annular groove receiving said inward edge of said cover portion of said cap;

said cup-shaped closure portion being in contiguous contact with the outer surface of said cover portion and with at least part of said tubular portion of said cap, thereby forming a continuous first sealing surface; and

the inner surface of said cover portion of said cap being in contact with said plurality of tongue-shaped portions, thereby forming a second sealing surface.

3,905,505

FUEL TANK FOR AUTOMOBILE VEHICLES

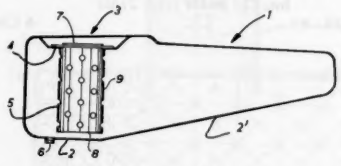
Francis J. Gallay, Boulogne-sur-Seine, France, assignor to Techni-Plaste S.A., Paris, France

Filed Oct. 5, 1973, Ser. No. 403,905

Claims priority, application France, Oct. 17, 1972, 72.36662

Int. Cl.[2] B65D *85/00*

U.S. Cl. 220—22 3 Claims



1. A fuel tank for a vehicle having a housing enclosing a fuel storage space, said housing having top and bottom walls, an aperture in said bottom wall for flow of fuel therefrom, and means for retarding flow of fluid in said space from over the aperture when the tank tilts with the portion having the aperture in an elevated position, said means comprising a tubular member having open ends and a plurality of openings in its wall for flow of fluid transversely therethrough, said tubular member being secured at one end to said top wall and having its opposite end disposed in spaced relation with the bottom wall adjacent to the said aperture.

3,905,506

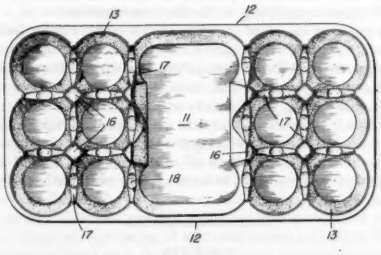
TRAY

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,337

Int. Cl.[2] B65D *1/36;* A47G *23/06*

U.S. Cl. 220—23.8 1 Claim



1. A one piece foamed plastic tray for transportation, storage and dispensing of different articles including frustro-conical containers disposed to rest on the small end and having an upper large end open for filling and discharge of contents; said tray being formed to provide a centrally disposed bin portion and two cell portions, one on each side of said bin portion;

a. a flange extending outwardly about the upper periphery of said tray;

b. said bin portion comprising a generally rectangular bottom wall and side walls integral with said bottom wall extending upwardly and outwardly therefrom, two of which side walls are integral at the upper edge thereof with said flange and two of which adjacent said cell portions extend upwardly to posts having an upper surface in the plane of said flange and which are interrupted between said posts as hereinafter recited with respect to walls of cells;

c. each of said cell portions comprising a plurality of cells each having a flat circular bottom wall in the plane of the bottom wall of said bin portion and side walls which diverge upwardly from said bottom wall to posts having an upper surface in the plane of said flange interrupted by openings between adjacent cells and between said bin portion and cells adjacent thereto by openings upwardly from a point intermediate said bottom wall and the upper surface of said posts;

d. and webs of foamed plastic constituted by the portions of said side walls of adjacent cells and of said bin portion below said interruptions connected across their upper edges to provide girders which afford strength to the tray, each of said cell portions having at least four cells, the same being arranged in a pattern in which the axes of four adjacent cells define the corners of a square.

3,905,507

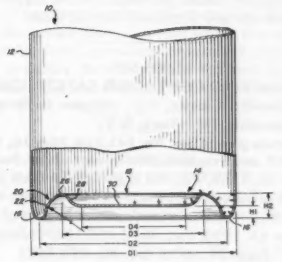
PROFILED BOTTOM WALL FOR CONTAINERS

Seung W. Lyu, Homewood, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed Apr. 5, 1974, Ser. No. 458,213

Int. Cl.[2] B65D *7/42*

U.S. Cl. 220—66 13 Claims



1. A metal container having a cylindrical side wall and an effectively rigid bottom wall integral therewith at the bottom end thereof, said bottom wall and side wall merging along one end of an annular outwardly directed bead, said bead having an end opposite to said one end spaced diametrically inwardly thereof, said bottom wall having an annular inwardly directed bead located within said outwardly directed bead, said inwardly directed bead having opposite ends one of which is adjacent said opposite end of said outwardly directed bead, and an arcuate portion interconnecting the two adjacent ends of the respective beads, said arcuate portion producing a convex surface within said container between said beads, said arcuate portion and said beads providing resistance to outward deformation of said bottom wall when pressure is applied inside said container, said bottom wall further including a generally flat central portion within said inwardly directed bead, said generally flat portion being spaced vertically above the lower end of said outwardly directed bead and vertically below the upper end of said inwardly directed bead, said generally flat portion merging with an adjacent end of said inwardly directed bead along a second arcuate portion defining a concave surface inside said container.

3,905,508

CRYOGENIC TANK SUPPORT SYSTEM

Joseph J. Hibl, and Harold E. Sutton, both of Boulder, Colo., assignors to Beech Aircraft Corporation, Wichita, Kans.

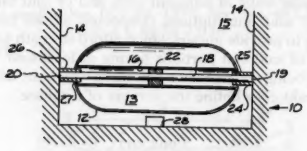
Filed July 5, 1973, Ser. No. 376,730

Int. Cl.[2] F17C *13/08*

U.S. Cl. 220—15 14 Claims

1. A tank for storing and transporting cryogenic fluids under varying inertial loads comprising the combination of:

an inner vessel adapted to contain cryogenic fluids;
an outer vessel substantially surrounding the inner vessel and defining therewith a vauum-tight insulated space around the inner vessel;
a multi-stage supporting system including a first support means comprising a beam of flexible insulative material supporting the inner vessel within the outer vessel under low inertial loads; and



a second support means of insulative material located between the vessels for high inertial loads, said second support means engaging only when the inertial load on the tank is sufficient to cause the first support means to reach a certain point of deflection, at which point the second support means provides positive support between the vessels for any additional inertial loads.

3,905,509

DOUBLE-ACTING CONTAINER SAFETY CLOSURE

Isral J. Markowitz, Closter, N.J., assignor to Stem Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 141,524, May 10, 1971, Pat. No. 3,768,703, and a continuation-in-part of Ser. No. 850,897, Aug. 18, 1969, Pat. No. 3,595,427, which is a continuation-in-part of Ser. No. 680,937, Nov. 6, 1967, Pat. No. 3,462,045, which is a continuation-in-part of Ser. No. 19,228, May 13, 1970, Pat. No. 3,655,100. This application Sept. 27, 1972, Ser. No. 292,558

Int. Cl.[2] B65D *41/08, 45/30, 55/02;* **A61J** *1/00*

U.S. Cl. 220—319 **3 Claims**

1. A child-resistant safety closure for use with a container or the like, comprising, in combination: a container neck portion having a bead or lip member, ring means in the form of a cup-shaped element and formed of a plastic material with outer thread means and encircling said neck portion so as to be freely rotatable thereabout and retained thereon by said bead or lip member, a cover member having a skirt and formed with inner thread means which normally contact said outer thread means of said ring means during use as a unit freely rotatable in both clockwise and counterclockwise directions, and concealed teeth means forming a part of both said cover member and said ring means for providing additional frictional interlocking resistance of said cover member to said ring means beyond the resistance of said thread means; said cup-shaped element having an outer skirt portion and an upturned flange edge portion forming a channel therebetween; the lower edge of said skirt of said cover member being adapted to be seated within said channel; and the lower edge of said skirt of said cover member and the base of said channel having said concealed teeth means; whereby removal of said cover member from said ring means requires the frictional yielding of said teeth means while one of said ring means or said cover member is held and the other rotated to disengage said threaded means of said safety closure.

3,905,510

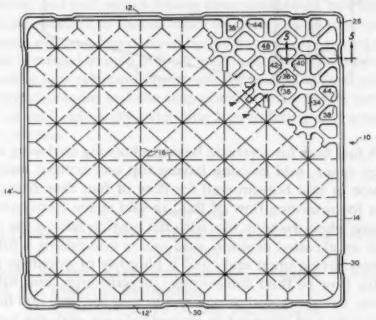
TRAY

Lewis T. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 7, 1973, Ser. No. 413,581

Int. Cl.[2] B65D *1/34, 21/02*

U.S. Cl. 220—83 **6 Claims**



1. In a tray comprising, in combination, a pair of upstanding opposed first wall members, a pair of upstanding opposed second wall members transverse to said first wall members, each of said wall members comprising an upper portion and a lower portion with said upper portion being offset outwardly and upwardly from said lower portion, and said first wall members being joined in a curved junction along the upstanding edges thereof to the upstanding edges of said second wall members, and a bottom member joined to said lower portions of said wall members to provide an open top structure, the improvement comprising, in further combination:

said upper portions of said first wall members being joined in a substantially square junction along the upstanding edges thereof to the upstanding edges of said upper portions of said second wall members to form an upper wall portion having substantially square corners; and

said lower portions of said first wall members being joined in a curved junction along the upstanding edges thereof to the upstanding edges of said lower portions of said second wall members to form a lower wall portion having curved corners.

3,905,511

JACKET FOR CANNED BEVERAGES

Bruce C. Groendal, 3231 Hanley Rd., Muskegon, Mich. 49441

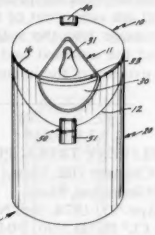
Filed Sept. 7, 1973, Ser. No. 395,057

Int. Cl.[2] A47G *19/22*

U.S. Cl. 220—90.2 **3 Claims**

1. An insulated jacket for removably receiving cylindrical beverage containers of the type from which the contents can be consumed by drinking directly from an opening in one end of the container, said jacket comprising: a lower cylindrical body portion of insulating material, an upper cylindrical body portion of insulating material, said upper body portion having an opening therethrough having a maximum width along the juncture of its side wall and top wall, said opening extending into both said side and top walls and being of a size to provide access for the user's mouth whereby the contents of the container can be consumed without removal of said jacket, said body portions combining to form a substantially closed-top

cylindrical jacket, hinge means for joining said upper and lower body portions, said hinge means being opposite from



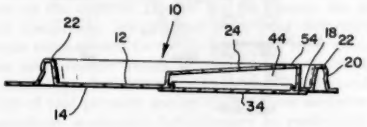
said opening; a latch for detachably holding said upper body portion in closed relationship to said lower body portion.

3,905,512

DRINKING RECEPTACLE COVER AND LIP OPERATED VALVE

Kenneth J. Albert, 7212 Sunset Blvd., Hollywood, Calif. 90046, and James Sloan Rice, 6680 Lexington Ave., Hollywood, Calif. 90038

Filed June 24, 1974, Ser. No. 482,364
Int. Cl. B65d *25/40, 47/20*
U.S. Cl. 220—90.4 6 Claims



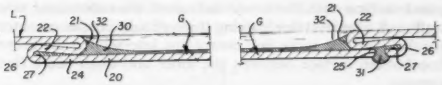
1. In a drinking receptacle cover and lip operated valve, the combination of: a drinking receptacle cover comprising a generally disc like structure having upper and lower surfaces; said disc like structure having a generally peripheral portion adapted to sealingly and frictionally engage an open end of a drinking receptacle; said cover having an opening adjacent said peripheral portion; a valve support adjacent said peripheral portion of said cover and resiliently hinged thereto; said valve support having a flexible resilient hinge portion integral with said disc like structure; said hinge portion being spaced from said peripheral portion; said valve support having a vertically movable portion adjacent said peripheral portion; said hinge portion being of material having a resilient memory tending to hold said vertically movable portion of said valve support upwardly relative to said upper surface of said disc like structure; said disc like structure having a valve seat portion surrounding said opening at said lower surface of said disc like structure; a valve member secured to said valve support and normally engaging said valve seat portion for normally closing said opening; said resilient material of said hinge tending to hold said valve member against said valve seat portion; said valve support being of lesser area in the plane of said opening than said opening to allow fluid to flow through said opening and around said valve support portion when said valve member is in open position relative to said seat portion; said valve support having an upwardly protruding portion adapted to be engaged by a person's upper lip, whereby a person may depress said valve support towards said inner surface of said disc like structure, thereby deflecting said resilient hinge portion and causing said valve member to be moved downwardly away from said valve seat portion and to thereby allow fluids to flow through said opening.

3,905,513

SEALANT FOR PUSHDOWN GATE IN A CAN LID

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Filed June 18, 1973, Ser. No. 370,924
Int. Cl.² B65D *43/02*
U.S. Cl. 220—268 7 Claims



1. In a can lid having a pushdown gate defined by a score line in the face of the lid, which is torn and severed when the gate is pushed downwardly into the can, and a small, narrow, lanced opening at the score line to facilitate the initiation of the tearing and severing of the score line whenever the gate is pushed downwardly, a sealing arrangement including:

a portion of the can lid folded against and lapping over the gate at the lanced opening to constitute a back-up surface at the lanced opening;

an offset in the outer surface of the can adjacent to the lanced opening forming an indentation; and

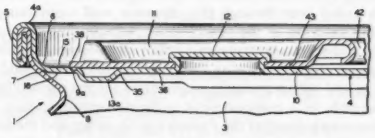
a wax-like sealer-filler, of a type which may be obtained as a settable fluid, extending continuously from the indentation as a fillet, thence between the back-up surfaces as a capillary layer and thence into the lanced opening as a plug.

3,905,514

CAN END WITH PROTECTIVE BEAD

John D. Dragomier, Canton, and Donald E. Stargell, North Canton, both of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Filed Mar. 16, 1972, Ser. No. 235,318
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 12 Claims



1. Easy opening metal food products can construction including a metal can body, an end wall, double seam means connecting the end wall to the can body; the end wall having a recessed corner located below the seam, and having a recessed portion extending from said corner, an end-panel-defining continuous main score line formed in the recessed portion close to the recessed corner; pull tab means secured to the end panel for tearing the end panel from the end wall; a protective bead formed downwardly in the end wall recessed portion and extending continuously around the end wall immediately within and adjacent the main score line; the recessed end panel having a center and upper and lower surfaces; the cross-sectional profile of the main score line comprising outer and inner side surfaces converging with respect to a center line perpendicular to the upper panel surface from the upper toward the lower panel surface, a score line bottom surface intersecting at outer and inner corners with and connecting the lower ends of the converging outer and inner side surfaces, and the score line bottom surface extending angularly inward with respect to the panel center and downward toward the lower panel surface; the protective bead having a channel-shape in cross section with outer and inner side walls and a connecting bottom web wall; the cross-sectional profile

of the outer bead side wall comprising upper and lower surfaces, a curved wall portion extending inward from the main score line and connected with the upper end of the outer bead side wall, the curved wall portion having upper and lower arcuate surfaces formed on radii about a common center, the upper arcuate surface connecting the upper end of the inner score line side surface with the upper surface of the outer bead side wall, and the lower arcuate surface connecting the lower panel surface with the lower surface of the outer bead side wall; and a vertical line passing through said common center parallel with the score line center line intersecting the score line bottom surface between the inner and outer score line corners.

3,905,515

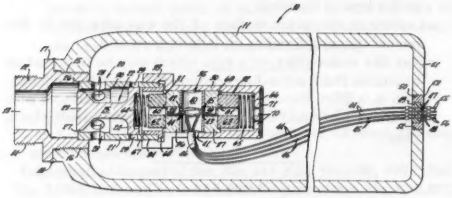
TWO-STAGE, PRESSURE AUGMENTED INFLATOR ASSEMBLY

James G. Allemann, Santa Ana, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Nov. 20, 1972, Ser. No. 307,861

Int. Cl. B67b *7/24*

U.S. Cl. 222—3 **18 Claims**



12. In an inflator assembly of the type utilizing a high pressure gas vessel having an interiorally-disposed elongated subassembly carried in cantilever support from the vessel outlet with the subassembly having a first position closing the vessel outlet and a second position opening the vessel to gas flow therefrom, said elongated subassembly having an axially-extending cylindrical chamber opening into the vessel outlet, with a radial port through the chamber wall connecting the chamber interior to the vessel space surrounding the subassembly and with a pressure-movable valve member within the cylindrical chamber closing the vessel to gas flow in said first position and with a pressure augmenting means carried by the subassembly in a compartment in fluid communication with the unsupported end of the cylindrical chamber and means for igniting the pressure augmenting means to move the valve member to said second position, thus opening the vessel and cylindrical chamber to gas flow, wherein the improvement comprises:

the cylindrical chamber of the elongated subassembly being provided with a first radial port adjacent the supported end of said subassembly and a longitudinally-spaced, second radial port adjacent the unsupported end of said cylindrical chamber;

the pressure-movable valve in said first position having a first end in sealed closure with the supported end of the cylindrical chamber, spaced outwardly from the first radial port, and a second end of slightly less diameter than the cylindrical chamber, closing the second radial port in the first position of the valve with a longitudinally-extending central portion of reduced dimension connecting the first and second ends of the valve, said reduced dimension central portion together with the interior surfaces of the two valve ends defining a void within the cylindrical chamber which void connects to the vessel space surrounding the subassembly via the first port; and

a blocking means for stopping the valve in its outward movement to its second position, where the second end of the valve is positioned between the first and second radial ports and wherein the seal of the first end of the valve is broken and said first end is moved outwardly into its second position, whereby the combustion product of the pressure augmenting means passes via said second radial passage into the chamber interior surrounding the subassembly to augment the pressure of the gas therein and the stored gas passes out of the vessel through the first radial passage into the cylindrical chamber and thence, around the unsealed said one end of the valve means to the exterior of the inflator assembly.

3,905,516

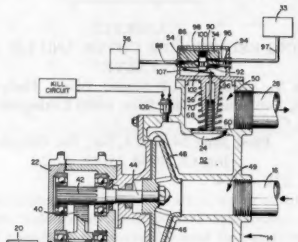
FUEL OIL DELIVERY TRUCK PUMPING SYSTEM

Jeffry A. Wisnia, Chestnut Hill, Mass., assignor to Scully Signal Company, Wilmington, Mass.

Filed Apr. 12, 1974, Ser. No. 460,500

Int. Cl.[2] B67D *5/36;* **F04B** *49/00*

U.S. Cl. 222—63 **9 Claims**



1. In a pumping system including: a pump housing having a blade element rotatably mounted therein, said pump housing having intake and outlet ports; a liquid fuel storage tank connected to the pump housing intake port; a delivery hose connected to the pump housing outlet port; a manually closable nozzle mounted on the free end of the delivery hose; an engine having a power take-off drivably engaging the pump blade element; and an adjustable throttle linked to the engine to modify the speed of the engine and the resultant speed of the engaged pump blade element; the improvement therein comprising:

a. a poppet valve mounted in the outlet port of the pump housing, said poppet valve being spring-loaded to seat and fully close in the absence of a preset fluid pressure differential upstream and downstream of said valve created by a closed hose nozzle, said closed poppet valve maintaining a desired downstream hose pressure and preventing upstream liquid flow therethrough;

b. said poppet valve being spring-loaded to unseat and open in the presence of a preset fluid pressure differential upstream and downstream of said valve caused by an open hose nozzle, said open poppet valve permitting downstream liquid flow therethrough; and

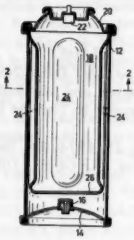
c. an actuator mechanism linked to the adjustable throttle, said actuator mechanism being responsive to the unseated position of said poppet valve to advance the engine throttle, and being responsive to the seated position of said poppet valve to retard the engine throttle, the throttle position controlling the speed of the pump blade element.

3,905,517

DEVICE FOR HOLDING AND DISCHARGING LIQUID AND PASTE-LIKE SUBSTANCES UNDER PRESSURE

Richard Friedrich, Welschingen, Hegau, Germany, and Frank A. E. Rindelaub, Schaffhausen, Switzerland, assignors to International Presspack Company, Switzerland

Filed Mar. 22, 1972, Ser. No. 237,107
Int. Cl.² B65D *35/28*
U.S. Cl. 222—95 **6 Claims**



1. In a device for storing and discharging fluid and paste-like substances comprising a rigid outer container and a generally cylindrical, flexible metal inner container having inner and outer surfaces and positioned within said outer container to define a space therebetween, pressure means in said space, and discharge valve means communicating with said metal inner container, said device being operative upon actuation of said discharge valve means to discharge contents of said metal inner container under the action of said pressure means thereon, said pressure means collapsing said metal inner container as the contents thereof are discharged, the improvement comprising: longitudinal weakening deformations of arcuate cross-section formed in said metal inner container to cause said pressure means, upon actuation of said discharge valve means, to fold said metal inner container inward by said action of said pressure means on the outer surfaces of said longitudinal weakening deformations in preference to the remainder of said outer surface of said metal inner container.

3,905,518

REMOTE DISPENSING HEAD WITH A CONCEALED EXPANSION CHAMBER FOR HEATED FLUID DISPENSING SYSTEMS

Richard C. Dreibelbis, Fair Lawn; Arthur C. Homeyer, Essex Fells, and Warren E. Turner, Succasunna, all of N.J., assignors to Emerson Electric Co., St. Louis, Mo.

Filed June 19, 1974, Ser. No. 480,675
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 HE **8 Claims**

1. A dispensing head for an associated dispensing system for heated fluid disposed at a point of attachment remote from the associated dispensing system including,

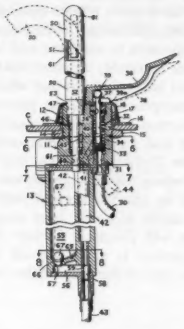
a. means forming a control valve section and an expansion chamber section disposed therein for operative association,

b. connecting means for attaching the dispensing head so that only a small part of the upper portion of the control valve section is visible above the point of attachment and the remaining part of the dispensing head including the expansion chamber section is concealed below the point of attachment,

c. said control valve section having, an inlet connected to the fluid to be heated in said associated dispensing system, an outlet for said fluid, valve means normally maintaining the inlet closed for controlling flow of incoming fluid through the dispensing head, a discharge passage for heated fluid, and a discharge spout operatively associated with the discharge passage for discharging heated fluid delivered to the dispensing head,

d. passage means in said expansion chamber section connected at one end to the outlet in said control valve section and at the opposite end disposed for delivering incoming fluid to be heated to the associated dispensing system when the valve means is actuated to open the inlet,

e. said expansion chamber section forming an expansion chamber having a predetermined volume for collecting fluid therein and a connecting passage with aspirating means therein connected between the lowermost part of the expansion chamber and at the end remote therefrom



with the passage means for delivering incoming fluid whereby aspiration of collected fluid from the expansion chamber will occur when incoming fluid to be heated is delivered to the associated dispensing system,

f. a combined overflow and vent means at the upper end of said expansion chamber section connected at one end to the expansion chamber and at the end remote therefrom to the discharge spout, and

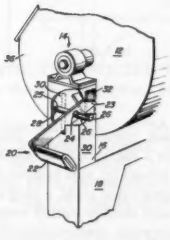
g. means operated by the level of the collected fluid in the expansion chamber to close the connecting passage when substantially all of the collected fluid is aspirated from the expansion chamber.

3,905,519

MIXER DRUM WITH AUTOMATIC LATCHING AND KNEE-LIFT UNLATCHING ASSEMBLY

Christian T. Tertinek, Canandaigua, N.Y., and Guthrie B. Stone, Brunswick, Ga., assignors to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Mar. 26, 1974, Ser. No. 455,039
Int. Cl.² B65G *67/30*
U.S. Cl. 222—166 **8 Claims**



1. In a gravity dumping device, the combination of an elongated receptacle having an aperture or opening in its upper-

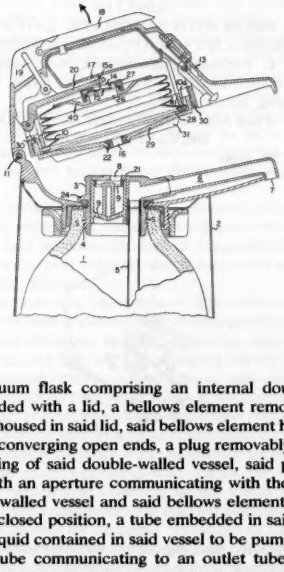
most portion, and end walls at the opposite extremities of its longitudinal extent, supporting means including standards adjacent said end walls, pivotal connections between the standards and their respective end walls for pivotally supporting said elongated receptacle for oscillation about said pivotal connections, handle means attached to one end wall of said receptacle and extending beyond the periphery of said receptacle, a generally V-shaped latch plate secured to said one end wall approximately half way between the pivotal connection of said one end wall to its adjacent standard and the periphery of said receptacle, a pivot bolt passing through said standard adjacent said end wall, and adjacent the lower portion or point of said V-shaped latch plate, a knee-operated member pivoted about said pivot bolt and having a bent, knee-engaging portion at its extremity opposite to said one end wall, and a bevelled portion at its other extremity adjacent said end wall and adjacent said V-shaped latch plate, so that when the handle is used to oscillate the receptacle about its pivotal connections, the knee-engaging portion is moved upwardly by a knee of an operator to pivot said member about said pivot bolt, so that the bottom of the V-shaped portion can clear the bevelled portion when dumping the receptacle, and when the receptacle is returned to its normal, upright position, the bottom of the V-shaped portion will ride over and past the bevelled portion and thus will preclude further dumping unless the knee-engaging portion is again moved to pivot the knee-operated member out-of-the-way of the V-shaped member.

3,905,520

VACUUM FLASK PROVIDED WITH A PUMPING DEVICE

Naruo Nishioka, Osaka, Japan, assignor to National Mahoobin Kogyo Kabushiki Kaisha, Sakai, Japan

Filed Apr. 10, 1974, Ser. No. 459,807
Claims priority, application Japan, Apr. 10, 1973, 48-43468
Int. Cl.[2] B67D 5/42
U.S. Cl. 222—209 **6 Claims**



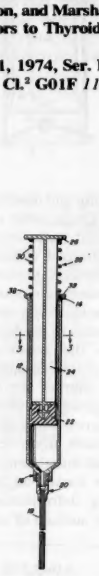
1. A vacuum flask comprising an internal doublewalled vessel provided with a lid, a bellows element removably and completely housed in said lid, said bellows element having first and second converging open ends, a plug removably disposed in the opening of said double-walled vessel, said plug being provided with an aperture communicating with the inside of said double-walled vessel and said bellows element when the lid is in the closed position, a tube embedded in said plug for allowing a liquid contained in said vessel to be pumped therefrom, said tube communicating to an outlet tube, a check valve floatingly confined in said first converging open end of said bellows element, said check valve being adapted to close up said first coverging open end of the bellows element under the backpressure produced by said bellows element, said second converging open end of said bellows element and said aperture in said plug being in aligment when the lid is closed over said double-walled vessel.

3,905,521

REAGENT DISPENSER

Louis W. Mead, Lexington, and Marshall E. Deutsch, Sudbury, both of Mass., assignors to Thyroid Diagnostics, Inc., Bedford, Mass.

Filed May 21, 1974, Ser. No. 471,958
Int. Cl.[2] G01F 11/06
U.S. Cl. 222—309 **1 Claim**



1. In combination with a standard syringe including a barrel member provided with finger grips, a constricted open end and a discharge end, a piston slidably arranged in the barrel, and a piston rod having a cross-shaped cross section and connected to the piston and arranged extending through the open end of the barrel, the open end being substantially larger than the cross section of the piston rod and a gap formed between the open end and the rod, a flange being provided on an end of the rod extending out of the barrel, and an annular recess being provided in the constricted open end adjacent the finger grips and arranged facing the flange; a coiled compression spring being arranged with coils of the spring around the rod and seated between the flange and the recess in the constricted open end of the barrel for biasing the rod and piston toward the open end; and a sleeve arranged in the barrel between the open end of the barrel and the piston for limiting movement of the piston toward the open end of the barrel, the sleeve being a split sleeve formed by a sheet having a thickness less than the gap between the piston rod and open end, and bent to close on itself and of a size which is less than the size of the constricted open end for permitting passage of the sleeve through the constricted open end and into the barrel, the constricted open end and the bias of the sleeve against the barrel causing the sleeve to be retained inside the barrel abutting the constricted end.

3,905,522

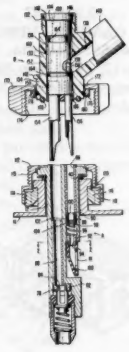
KEG TAPPING DEVICE

Mack S. Johnston, Rolling Hills, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Continuation-in-part of Ser. No. 155,231, June 21, 1971, which is a continuation of Ser. Nos. 851,008, Aug. 18, 1969, and Ser. No. 864,448, Oct. 7, 1969, which is a continuation-in-part of Ser. No. 851,008, Aug. 18, 1969, which is a continuation-in-part of Ser. No. 783,484, Dec. 13, 1968, Pat. No. 3,550,818, which is a continuation-in-part of Ser. No. 773,406, Nov. 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 676,291, Oct. 18, 1967, abandoned, which is a continuation-in-part of Ser. No. 611,610, Jan. 25, 1967, Pat. No. 3,410,458, which is a continuation-in-part of Ser. No. 587,627, Oct. 18, 1966, Pat. No. 3,422,448, which is a continuation of Ser. No. 406,682, Oct. 27, 1964, abandoned, which is a continuation-in-part of Ser. No. 395,084, Sept. 8, 1964, Pat. No. 3,231,154, and Ser. No. 150,982, Nov. 8, 1961, abandoned, said Ser. No. 395,084, is a continuation of Ser. No. 150,982,. This application July 31, 1973, Ser. No. 384,391

Int. Cl. B65d *83/00*

U.S. Cl. 222—400.7 49 Claims



31. A coupler unit for use with a keg adapter having liquid and gas passages comprising: an annular head and a stem receivable within said head, said coupler unit having liquid and gas passages therethrough terminating respectively at the inner ends of said coupler unit in a pair of tubular probes carried by said stem, said stem being spaced from the walls of said head to define an annular passage therewith, means sealing between said head and said stem at opposite ends of said annular passage, conduit means through said head in communication with said annular passage, said stem having a passageway in communication between said annular passage and said gas probe, and means carried about said annular head for releasably securing said coupler unit to the keg adapter with the liquid and gas probes being receivable in the respective liquid and gas passageways of the keg adapter.

3,905,523

FLUID FERTILIZER CONTROL APPARATUS

William H. Ahlers, Harlan, Iowa; Robert E. Derr, and La Monte H. Sahling, both of Wood River, Nebr., assignors to Harlan Mfg. Co., Inc., Harlan, Iowa

Filed Aug. 29, 1973, Ser. No. 392,676

Int. Cl. F16k *5/06, 31/163*

U.S. Cl. 222—504 1 Claim

1. Fertilizing apparatus comprising:

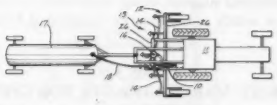
a supply tank for holding liquid fertilizer and having an outlet;

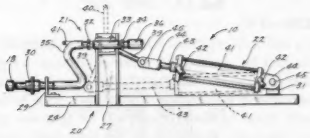
rotary valve means including a valve body having two ports, one of said ports being in fluid communication with said supply tank outlet;

a metering valve having an inlet and an outlet, said metering valve inlet being in fluid communication with the other port of said valve means;

means in fluid communication with the outlet of said metering valve for applying fertilizer to the soil;

support means including a base and two spaced upstanding members rigidly affixed to the base and extending substantially normal to the base, said valve body being mounted to the side of one of said upstanding members opposite from the other upstanding member;





a rotary valve actuator journaled along a first axis through said upstanding members, said actuator being rotatably received into said valve body, whereby rotation of said actuator effects opening or closing of said valve to the transmission of fluid therethrough;

an arm member rigidly attached to said actuator at one end thereof at a point on said actuator intermediate said upstanding members, said arm member being substantially perpendicular to the actuator;

a hydraulic cylinder pivotally mounted at one end thereof on a second axis fixed with respect to said base;

the other end of said hydraulic cylinder being pivotally mounted to the other end of said arm member along a third axis; and

wherein said first, second and third axes are substantially parallel with respect to each other.

3,905,524

PISTOL TYPE NOZZLE VALVE

Hiyoshi Tatsuno, 4-4-11, Shirogane, Minato-ku, Tokyo-to, Japan

Filed Mar. 25, 1974, Ser. No. 454,457

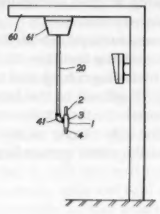
Claims priority, application Japan, Aug. 24, 1973, 48-94308; Aug. 24, 1973, 48-98620[U]; Aug. 24, 1973, 48-98621[U]; Aug. 24, 1973, 48-98622[U]

Int. Cl.[2] B67D *3/00*

U.S. Cl. 222—536 7 Claims

1. A pistol type nozzle valve for gasoline feeding comprising an elongated barrel frame having a valve means and a trigger element for opening and closing said valve means, a barrel top connected to said frame at one end thereof, a handle grip connected to said frame at the opposite end thereof, inlet means opening into a side of said frame between said top and

said grip, said inlet means including a pivotable elbow coupling and a gasoline inlet hose capable of being suspended



from an overhead support being connected to said coupling, whereby the nozzle valve may be suspended from said hose.

3,905,525

BALL MARKER HOLDER FOR GOLF

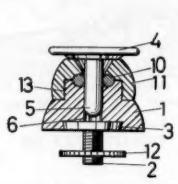
Kiyoshi Kawamata, Ohmiya, Japan, assignor to Nihon Seikan Kabushiki Kaisha, Ohmiya, Japan

Filed Feb. 9, 1973, Ser. No. 331,048

Claims priority, application Japan, Aug. 15, 1972, 47-095629; Nov. 2, 1972, 47-126803

Int. Cl.[2] A45F *5/02*

U.S. Cl. 224—5 C 2 Claims



1. A holder for holding a golf ball position marker which marks the position of a golf ball after said ball is removed from the ground, comprised of:

a body having a hole in a first end thereof for receiving a rod shaped member of said marker and a concave recess in said first end of said body surrounding said hole;

an annular rubber-like ring fitted into said concave recess for frictionally holding said rod-shaped member inserted into said hole through said annular rubber ring;

cap means secured to said body over said first end, said cap having a concave recess in the side thereof fitted next to said first end for fitting over said annular ring fitted in the recess in said first end, thereby holding said annular ring under pressure;

and threaded fastening means on a second end of said body opposite said first end for fastening said holder through buttonholes and the like.

3,905,526

CAMERA PROTECTOR MEMBER FOR USE WITH A SUSPENSION RING FOR CAMERA

Masakazu Tomatsuri, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,328

Claims priority, application Japan, Dec. 28, 1972, 48-4777

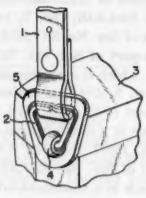
Int. Cl. A45f *5/00*

U.S. Cl. 224—5 V 3 Claims

1. In combination with a camera body having a pendant extending therefrom;

a suspension ring passing through and connected with said pendant,

a strap having a turned-back portion at the end thereof and releasably connected to said suspension ring by said turned-back portion,



a protector member having an aperture, said member being disposed between said camera body and said suspension ring with said pendant and said turned-back portion of said strap passing through said aperture and thereby preventing contact between said camera body and said suspension ring.

3,905,527

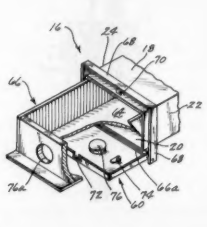
BUMPER FOR CAMPER SUPPORT VEHICLES

Patric N. Chamberlain, 565 Goodwin, Ankeny, Iowa 50021

Filed Jan. 17, 1974, Ser. No. 434,213

Int. Cl.[2] B60R *19/02*

U.S. Cl. 224—42.03 A 6 Claims



1. A bumper for camper supporting vehicles, trailers and the like, comprising,

a bumper frame having top and bottom walls, and oppositely disposed side walls,

said frame defining an interior compartment,

end walls on each end of said bumper, and at least one of said end walls being movable from closed to open positions to provide access to said interior compartment,

means for attaching said bumper to the frame of said supporting vehicle,

said one end wall having a horizontally disposed portion extending inwardly from the upper end thereof,

said horizontally disposed portion having a first notch formed therein extending into the inner end thereof and a laterally extending second notch extending from the inner end of said first notch,

a first latch on said bumper adapted to be received by said first and second notches,

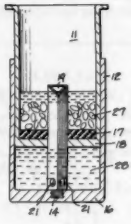
said one end wall being pivotally mounted about its lower end to said bumper,

said one end being laterally movable with respect to its pivotal axis so that said one end wall may be maintained in its closed position by causing said first latch to be initially received by said first notch and then laterally moving said one end wall so that said first latch is received by said second notch.

3,905,528
TWO-PIECE CONCENTRIC CENTRIFUGE SAMPLE CONTAINER

Hugh V. Maiocco, 1151 Griffith Ln., Brentwood, Calif. 94513

Filed Apr. 10, 1974, Ser. No. 459,573
Int. Cl.[2] B04B 9/12
U.S. Cl. 233—26 7 Claims



1. In a centrifuge, a container assembly for containing a fluid mixture during centrifugation and for separating phases of said fluid mixture resulting from centrifugation, said container assembly comprising

a. an outer container;

b. an inner container, telescopically engageable with said outer container, and having an opening in the base thereof;

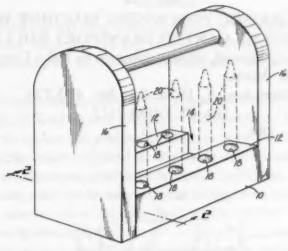
c. a conduit threadably secured to the base of said outer container and communicating said outer container with said inner container through said opening in the base of said inner container; and

d. sealing means for preventing fluid leakage into said outer container from said inner container through said opening in the base thereof.

3,905,529
CRAYON CARRYING AND STORING DEVICE

Charles N. Leu, 4460 Nettleton Rd., Medina, Ohio 44256

Filed Jan. 28, 1974, Ser. No. 437,011
Int. Cl.[2] A47B 81/00
U.S. Cl. 224—48 R 1 Claim



1. A crayon transporting and storing device comprising,

a base member,

a pair of solid side members permanently secured to the opposite lateral sides of said base member and extending a substantial distance thereabove and parallel with each other to form with said base member a rectilinear trough therebetween,

a pair of end members disposed at opposite ends of said base members and cooperating therewith and with said side members to close the ends of said trough and provided unrestricted access to the trough from above thereby allowing for storage and retrieval of small objects therein,

said end members rising above said side members,

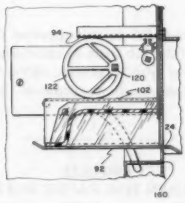
each of said side members having a plurality of spaced bottomed vertically extending apertures having continuous side walls the length thereof configured and arranged to receive and support crayons in vertically extending positions, crayons disposed in vertical position in said apertures,

and handle means extending between said end members for carrying said device.

3,905,530
NEWSPAPER VENDING MACHINE

Frank E. Emmel, 321 Herschel, Wichita, Kans. 67209

Filed Mar. 26, 1973, Ser. No. 345,220
Int. Cl.[2] A47F 1/04
U.S. Cl. 221—155 24 Claims



1. In a dispensing machine of the type that has a provision for urging vertical movement of a stack of rectangular flat articles disposed within a housing upwardly to position the uppermost of such articles to a dispensing position adjacent a dispensing opening in a vertical wall of such housing; the combination therewith of stop means disposed within the housing for limiting upward vertical movement of articles stacked within the housing, gauging means for securing the stop means to the housing at any one of a plurality of selected positions of differing height, said stop means being disposed adjacent said vertical wall and in close proximity to said dispensing opening in an arrangement such that the selected height at which the stop means is secured to the housing predetermines the effective vertical extent of the dispensing opening that is unobstructed by the stop means and the maximum vertical thickness of an uppermost stacked article that can be dispensed horizontally from within the housing through the dispensing opening, said gauging means comprising the stop means including a carriage mounted on said vertical wall for guided vertical sliding movement relative thereto, actuating means oscillatably mounted on the vertical wall for actuating vertical movement of the carriage in response to oscillatory movement of the actuating means, securing means for releasably securing the actuating means in any selected one of a plurality of angular positions, said actuating means comprises a shaft mounted for rotation, a cam wheel eccentrically mounted on said shaft, said carriage including a pair of spaced parallel elements rotatably receiving therebetween and slidably engaging the cam wheel.

3,905,531
BOOK ROUGH CUTTER WITH RAKER TOOTH

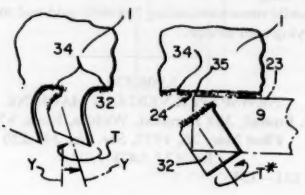
Peter Aspinwall, Baldwin Rd., Carlisle, Mass. 01741

Division of Ser. No. 366,464, June 4, 1973, Pat. No. 3,860,158.
This application Aug. 5, 1974, Ser. No. 494,558
Int. Cl. B26f 3/02
U.S. Cl. 225—3 3 Claims

1. The method of roughing the leaf edges at the backbone of an unbound fibre paper book comprising:

cutting into the backbone at spaced locations along the backbone to form a series of discrete tab like particles depending from the backbone edge of each leaf;

axially twisting each tab in one direction and bending the tab along the plane of the leaf, partially to tear the tab from its leaf to expose paper fibres; and then



axially twisting each tab in the opposite direction to complete tearing of the tab from its sheet and form a substantially continuous fibre exposure along the tear line and substantially completely to remove the tabs from the leaves.

3,905,532

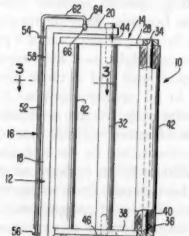
HOLDER FOR PAPER ROLLS

Charles E. Eberly, Pleasanton, Calif., assignor to Bemiss-Jason Corporation, Palo Alto, Calif.

Filed Nov. 5, 1973, Ser. No. 412,849

Int. Cl.[2] B26F *3/02*

U.S. Cl. 225—35 **5 Claims**



1. A holder for a plurality of paper rolls comprising: a magazine having a pair of opposed, spaced end members and means on the outer peripheries of the end members for rotatably mounting a plurality of paper rolls in respective operative positions thereon with the axes of the rolls extending between the end members; means coupled with the magazine for mounting the same for rotation about an axis extending longitudinally of the axes of the paper rolls when the same are in said operative positions, said mounting means having a fixed post extending longitudinally of said axes of the paper rolls; a bar having a paper-engaging edge; means shiftably mounting the bar on the post with the bar extending longitudinally thereof; and means coupled with the bar for releasably locking the same in a fixed position with said edge of the bar clamping a portion of the paper of one of the rolls to said post, whereby the paper can be pulled against said edge and torn as the bar remains in said fixed position.

3,905,533

APPARATUS FOR REGULATING TENSION IN SHEET MATERIAL

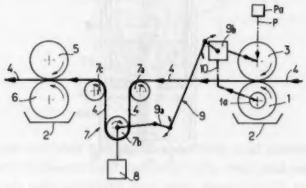
Louis Corse, Orleans, France, assignor to Societe d'Etudes de Machines Speciales, France

Filed Jan. 9, 1974, Ser. No. 431,978

Claims priority, application France, Jan. 11, 1973, 73.00898

Int. Cl. B65h *25/04*

U.S. Cl. 226—44 **1 Claim**



1. In a printing system;

means for imprinting an elongate sheet and for delivering the imprinted, elongate sheet, comprising a rigid engraved plate cylinder having power means for rotating it at a first speed and a flexible impression cylinder having power means for rotating it at a second speed correlated with said first speed, said cylinders having parallel axes; pressure means for pressing one of the cylinders against the sheet and thereby against the other cylinder;

means for maintaining a loop in the delivered sheet; jockey roll means biased for engaging the loop to maintain tension therein and to respond to variations in said tension by movements of the jockey roll means to different positions to compensate said variations in tension; and

control means controlled by the jockey roll means for responding to the movements thereof and for thereby controlling one of the power means to vary one of said speeds relative to the other speed so as to compensate said movements of the jockey roll means;

thereby enabling regulation of said tension independently of said pressure means.

3,905,534

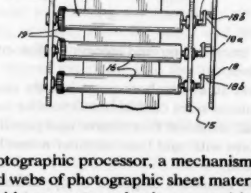
PHOTOGRAPHIC PROCESSING MACHINE WITH OPPOSITELY CANTED TRANSPORT ROLLER

Conrad E. Lee, Mound, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Aug. 1, 1974, Ser. No. 493,721

Int. Cl. G03d *1/12*

U.S. Cl. 226—184 **2 Claims**



1. In a photographic processor, a mechanism for transporting elongated webs of photographic sheet material through the processor, said transport mechanism comprising:

a roller supporting structure,

a plurality of pairs of cylindrical transport rollers mounted on said structure and arranged to define a continuous web path through the processor,

the spacing between the rollers of each pair being greater than the thickness of the web to be transported and the rollers of each pair being parallel to each other,

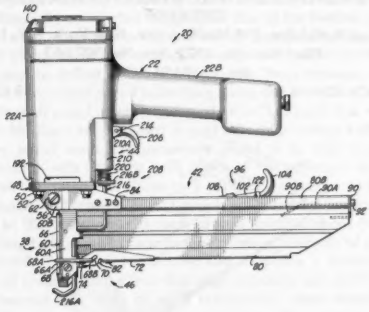
adjacent rollers being oppositely canted to produce a zigzag path for the marginal edge portions of a web of material being transported through said rollers and limit the contact between the web and the rollers to only the marginal edge portions of the web, and

means for driving said rollers to transport a web through the processor along the desired path therein.

3,905,535
FASTENER DRIVING TOOL

Raymond F. Novak, Schiller Park; Howard B. Ramspeck, Chicago; Bernard W. Geist, Melrose Park, and Frank R. Potucek, Des Plaines, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed Sept. 13, 1973, Ser. No. 396,878
Int. Cl.[2] B25C *5/10, 5/16*
U.S. Cl. 227—120 **16 Claims**



1. A tool for driving fasteners into a workpiece comprising a powered fastener driving assembly including a driver element actuated by a drive piston slidable within a drive cylinder,

a fluid controlled main valve means opened to supply pressurized fluid to and closed to exhaust fluid from the cylinder to move the piston through power and return strokes, a cycle valve coupled to the main valve means and operable to alternate positions to open and close the main valve means, said cycle valve being biased to a position to close the main valve means, said cycle valve also including valve piston means,

passage means coupling the valve piston means to the drive cylinder to receive pressurized fluid for biasing the cycle valve to a position to close the main valve means,

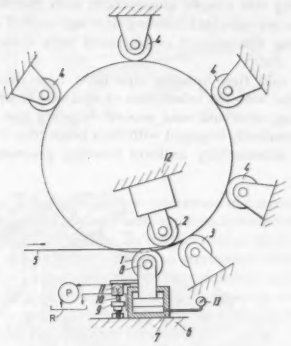
return valve means responsive to the exhaust of the drive cylinder above the drive piston for supplying pressurized fluid into the drive cylinder below the drive piston to move the drive piston through a return stroke, the pressurized fluid below the drive piston being supplied to the valve piston means to bias the cycle valve to a position to close the main valve means,

and means responsive to the completion of the return stroke of the drive piston for controlling the return valve means to terminate the supply of pressurized fluid to the drive cylinder below the piston means and thus to the valve piston means.

3,905,536
APPARATUS FOR USE IN THE PRODUCTION OF SPIRAL-WELDED TUBES OR PIPES

Lorenz Claussen, Berlin, Germany, assignor to Berliner Maschinenbau-AG vormals L. Schwartzkopff, Berlin, Germany

Filed Mar. 9, 1973, Ser. No. 339,868
Claims priority, application Germany, Mar. 13, 1972, 2212744
Int. Cl. B23k *37/04;* **B21c** *37/06, 37/08*
U.S. Cl. 228—17 **1 Claim**



1. In an apparatus for the production of helical-welded pipe having guide means defining a circular path for a metal band and welding means for welding each turn as formed to previous turns of the band to form a helical seam pipe, the improvement which comprises:

bending means for imparting a bend to a oncoming band, said bending means comprising a first roller initially encountering said band, a second roller downstream of said first roller and subsequently encountering said band and a third roller downstream of said second roller and encountering said band thereafter, said first and third rollers engaging an external surface of the band to be bent and said second roller engaging an internal surface thereof, said rollers defining a circular arc having a radius of curvature less than the radius of said pipe;

pressurizable means for displacing one of said first and second rollers to adjust the curvature of the bend formed in said band, said guide means and the others of said rollers having a common frame;

a support independent of said frame for carrying said one of said rollers;

a device responsive to the position of said one of said rollers for controlling said pressurizable means; and

adjusting means including a bar mounted on said support and between said support and said device for setting the position of said one of said rollers in accordance with characteristics of the band, said device detecting the spacing of said one of said rollers from said bar to control said pressurizable means.

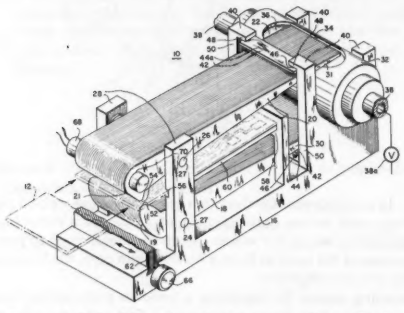
3,905,537
METHOD AND APPARATUS FOR COMPENSATING FOR SUBSTANCE VARIATIONS DURING LEAD FRAME BONDING

Glenn Lewis Schmehl, Morrisville, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed July 8, 1974, Ser. No. 486,295
Int. Cl.[2] B23K *19/00;* **H05K** *3/34*
U.S. Cl. 228—180 **13 Claims**

1. Method of bonding a plurality of leads to respective bonding sites on one face of a substantially planar article, said method comprising:

a. providing a plurality of first bonding tips, one for each bonding site, adapted to engage the other face of said article opposite the bonding sites;
b. providing a plurality of second bonding tips, one for each bonding site, adapted to engage said leads;
c. registering each of the bonding sites between the first and second bonding tips associated therewith;
d. registering each of the leads with its respective bonding site and between the said bonding site and the second bonding tip associated therewith;
e. concurrently and independently moving each of said first bonding tips toward engagement with that face of said article opposite said bonding sites and each of said second bonding tips toward engagement with their respective leads; and
f. after said first bonding tips have been independently engaged with the other face of said article opposite said bonding sites and said second bonding tips have been independently engaged with their respective leads, applying a substantially uniform bonding pressure with said

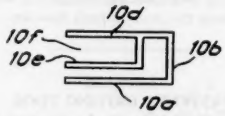


first and second bonding tips concurrently to all of said leads and bonding sites, thereby to concurrently bond all of said leads to their respective bonding sites.

4. Apparatus for bonding a plurality of leads to respective bonding sites on one face of an article, said apparatus comprising:
a. a plurality of first bonding tips, one for each bonding site, adapted to engage the other face of said article opposite the bonding sites;
b. a plurality of second bonding tips, one for each bonding site, adapted to engage said leads; and
c. means adapted to concurrently and independently move said first bonding tips toward engagement with the other face of said article opposite said bonding sites and said second bonding tips toward engagement with their respective leads and thereafter to apply a substantially uniform bonding pressure through said first and second bonding tips concurrently to all of said leads and bonding sites thereby concurrently to bond all of said leads to their respective bonding sites.

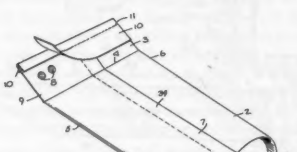
3,905,538
FOLDER
Kurt Lennart Ohlson, Morovagen 27, 161 40 Bromma, Sweden
Filed Jan. 4, 1974, Ser. No. 430,779
Int. Cl. G09f *3/18*
U.S. Cl. 229—1.5 R **8 Claims**

1. A combination of a folder and label holder comprising:
a. a folder having a back portion and two side portions extending therefrom, a flap contiguous with and forming an extension from a first of said side portions along an edge thereof remote from said back portion, three parallel crease lines adjacent said edge and flap, a first fold along the central one of said parallel crease lines whereby the flap is reversed to face the back portion, and folds along the remaining parallel crease lines to produce an upstanding, flat portion including said first fold and forming an L-shaped end portion with the adjacent fold and flap; and,
b. a label holder surrounding the L-shaped end portion of the folder, said label holder comprising an elongated, rigid member having a generally U-shaped cross section which includes a pair of legs forming side walls joined by



an end wall, the open end of said U-shaped cross section facing the back portion of the folder, said opening accommodating the free end of the second side of the folder when said folder is in the closed position, said label holder having an internal channel conforming to the L-shaped end of the folder and having said L-shaped end of the folder inserted therein.

3,905,539
UNITARY CONTAINER AND CLOSURE WITH DISPENSING MEANS AND APPARATUS FOR STORAGE THEREOF
Morison S. Cousins, 595 Madison Ave., New York, N.Y. 10022
Filed Nov. 16, 1972, Ser. No. 307,063
Int. Cl. B65d *3/08*
U.S. Cl. 229—4.5 **13 Claims**

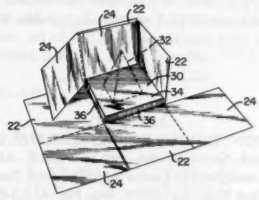


1. A self-closing container adapted for dispensing predetermined quantities of a container material, the container being a container which normally maintains itself in a closed state and which includes a linear closure which is opened by squeezing across the sides of the container, comprising:
1. a tube extending from a base, the tube when the container is in a closed position tapering along a portion of its length from a tubular shape to a linear closure which is accomplished by the disposition of inner facing surfaces of the tube substantially in contact with each other along a line which extends substantially across a diameter of the tube, the tube extending from a base comprising the portion of the container adapted for containing material and the linear closure comprising substantially a seal which is adapted for opening to allow the dispensation of quantities of the contained material and being further adapted for opening by means for squeezing the tube across and adjacent the diameter of the tube which substantially corresponds to the linear closure, and
2. means for the dispensation of the contents when the linear closure is opened by squeezing across the tube, the means for the dispensation of the contents including an upper tab portion which is unitary with and extending from the tube, and, when the container is closed, extends from the linear closure of the tube and comprises the disposition of the inner surfaces of the tube in substantially a parallel facing relationship.

3,905,540
BOX CONSTRUCTION

Dennis M. Abert, 4155 E. Jewell Ave., Denver, Colo. 80202

Filed Oct. 12, 1973, Ser. No. 406,104
Int. Cl.² B65D 5/22, 5/36
U.S. Cl. 229—16 R 1 Claim



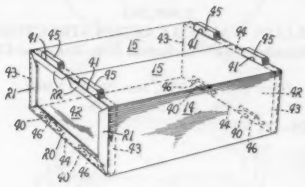
1. A box consisting of a blank sheet of cardboard material having a matrix of nine contiguous square panels of the same size defined by separation lines alternately in the form of fold lines and cut lines, a center panel of the matrix defining a bottom panel of the box and four double-ply side wall panels defined by four double flaps, each double flap consisting of two adjacent panels including a solid continuous side wall panel hingedly connected along a fold line to the bottom panel and a solid continuous reinforcement panel hingedly connected along a fold line to the side edge of an associated side wall panel to define a common side edge therebetween, each said reinforcement panel extending along the inner surface of the side wall panel of an adjacent double flap such that when the double flaps are disposed in coplanar relationship with the bottom panel each reinforcement panel is in edge-to-edge relationship with the side wall panel of the adjacent double flap and separated therefrom by a cut line, and when said side wall panels and reinforcement panels are disposed perpendicularly to the bottom panel each of said reinforcement panels extending fully along in face-to-face relation inwardly of a side wall panel of an adjacent double flap to define a double-ply side wall construction a free side edge opposite and parallel to the common side edge of each reinforcing panel extending along the entire extent of and contiguous to the common side edge formed at the fold line between the side wall panel and reinforcement panel of the next adjacent double flap; elevated article support platform means removably seated on said bottom panel in mutually reinforcing relation to said reinforcement panels between said support platform means and said side wall panels; and a square cardboard lid having a downturned flange along each side thereof so that the lid can be supported by the side wall panels and reinforcement panels and retain the side wall panels and reinforcement panels in perpendicular relation to the bottom panel.

3,905,541
CONTAINER

Gerald C. Paxton, Sanger, Calif., assignor to SWF Machinery, Inc., Sanger, Calif.

Filed June 18, 1973, Ser. No. 370,981
Int. Cl.² B65D 5/35, 13/00
U.S. Cl. 229—23 R 7 Claims

2. A fiberboard container presenting smooth continuous internal surfaces to contents thereof comprising an elongated substantially rectangular wall member having spaced substantially parallel transverse first fold lines defining a rectangular bottom wall therebetween, a second transverse fold line outwardly spaced from each first fold line and therewith defining a rectangular side wall, and an end edge outwardly spaced from each second fold line and therewith defining a rectangular top wall portion, the wall member being bent substantially 90° at each said fold line and its end edges abutting in a common plane substantially parallel to the bottom wall; a pair of spaced substantially identical end walls fitted between the bottom wall, side walls and top wall portions of the wall member in right angular relation thereto; said bottom wall, side walls and top wall portions having flaps continuous with the wall member folded outwardly over the end walls and bonded thereto; and the bottom wall and each end wall having a downwardly disposed receptacle provided upwardly therein and each end wall having a tongue upwardly extended there-

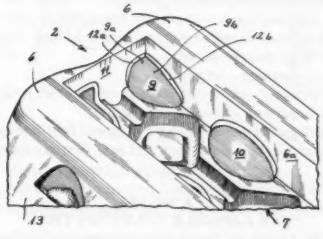


from through a top wall portion positioned in correspondence to said receptacles to be received in the receptacles of a superimposed container, the flaps on the top wall portion extending to opposite sides of the tongues to strengthen said top wall portion where the tongues extend therethrough and the flaps on the bottom wall portion extending to opposite sides of the receptacles to strengthen the end walls and bottom wall where the receptacles are disposed therein.

3,905,542
SIGHT PACKAGE FOR FRAGILE OBJECTS

Bent Moller, Varlose, Denmark, assignor to Aktieselskabet Brodrene Hartmann, Lyngby, Denmark

Filed Sept. 19, 1973, Ser. No. 398,600
Int. Cl. B65d 1/00, 85/32
U.S. Cl. 229—29 M 2 Claims



1. Article revealing carton for fragile objects, particularly eggs, comprising a container section with a cover section hinged thereto, said container section having a plurality of article receiving compartments arranged in at least two parallel rows and also upwardly extending projections located between said rows of compartments, said cover section having at least two upwardly projecting gable portions extending parallel with the rows of compartments and a lower cover section located between two neighboring gable portions and interconnecting the lowermost edges of the opposed sides of the neighboring gable portions, a number of apertures being provided corresponding to the compartments in the container section, said apertures being formed in the lower cover section and the sides of the gable portions adjoining thereto, and being arranged so as to coincide with the respective compartments in the container section when the cover section is closed thereon, an upwardly extending bulkhead being provided at each end of the lower cover section, the bulkhead extending upwardly from the lower cover section and being integral therewith, the bulkhead adjoining the said opposed sides of the neighboring gable portions, each bulkhead having

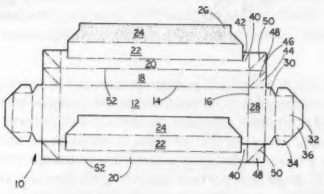
an aperture in each of the adjoining regions, each of said apertures continuing into an adjoining aperture formed in the lower cover section and the adjoining side of the corresponding gable portion, the cover section having an outer wall, said outer wall having a corrugated configuration and surrounding the bulkhead in such a way as to closely approach the bulkhead between its apertures.

3,905,543

HOLLOW WALLED CARTON STRUCTURE

Arthur E. Randles, 707 Warrington Ave., Redwood City, Calif. 94063

Filed Oct. 3, 1974, Ser. No. 511,944
Int. Cl.² B65D 5/24
U.S. Cl. 229—31 FS 3 Claims



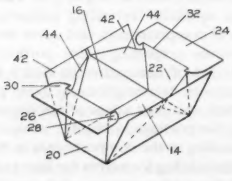
1. A hollow walled carton corner comprising:
a bottom panel having perpendicular end and side fold lines;
outer, top and inner side panels, respectively, connected to said bottom panel along said side fold line with parallel fold lines therebetween;
the length of said inner side panel terminating short of the end of said bottom panel;
a flap articulated to said inner side panel;
means adapted to secure said flap to said bottom panel;
a tab extending inward from the end of said top side panel to overlie said bottom panel;
outer, top and inner end panels, respectively, connected to said bottom panel along said end fold line with parallel fold lines therebetween;
the improvement comprising:
a first gusset panel having a diagonal fold line articulated to said outer end and side panels; and
a second gusset panel having a diagonal fold line articulated to said top side panel tab and said first gusset panel.

3,905,544

COLLAPSIBLE SOLUTION TRAY

William G. Tipton, St. Louis, Mo., assignor to Cavalier Packaging Company, Inc., St. Louis, Mo.

Filed May 6, 1974, Ser. No. 466,989
Int. Cl.² B65D 5/36, 5/24
U.S. Cl. 229—41 B 4 Claims



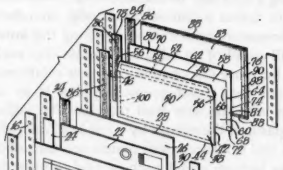
1. A collapsible box-like liquid retaining tray adapted to be erected from a foldable blank, said tray in the collapsed position comprising a bottom panel, a pair of end panels hingedly connected to and overlying opposite ends of said bottom panel, a pair of side panels hingedly connected to opposite sides of and lying in the same plane as said bottom panel, biasing panels connecting one side of the end panels to an intermediate bias line on the interior of the adjacent side panels at each corner of the tray, a pair of pull panels hingedly connected to the top of said end panels, said pull panels being operable upon being pulled away from one another to cause the end panels to assume an erected position and through the biasing panels connecting the end panels to the side panels cause the side panels to be pulled to the vertical position and locking means on said pull panels engageable with said side panels to lock said panels together.

3,905,545

CONTINUOUS FORMS ASSEMBLY

Joseph J. Juszak, Crystal Lake, and Howard K. Absler, Skokie, both of Ill., assignors to Uarco Incorporated, Barrington, Ill.

Filed Mar. 11, 1974, Ser. No. 450,147
Int. Cl.² B65D 27/10
U.S. Cl. 229—69 5 Claims



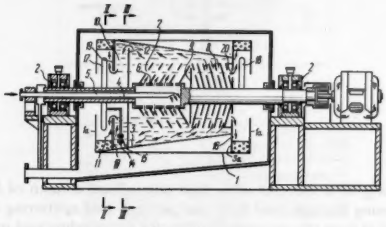
1. In a continuous forms envelope assembly wherein a plurality of elongated, superimposed plies including transverse lines of weakening defining individual envelopes which may be separated from the assembly therealong and wherein upper and lowermost ones of the plies define fronts and backs of envelopes with intermediate plies defining insert material within each envelope including at least a return envelope, the return envelope being defined by portions of adjacent intermediate plies, respectively defining the front and back of the return envelope, one of said adjacent plies further including an envelope flap that may be folded about and secured to the other of said adjacent plies for closing the return envelope and wherein the intermediate plies are constructed so that the insert material is free from the outer envelope along at least two, opposed, marginal edges of the outer envelope, the improvement wherein said other adjacent ply has an attaching portion secured to the outer envelope, said attaching portion being attached to a covering portion which is in substantial abutment with said flap; said attaching portion and said covering portion being loosely secured to the remainder of said other adjacent ply so that upon the opening of the outer envelope, the return envelope can be easily extracted with said attaching portion and said covering portion remaining interiorly of the outer envelope.

3,905,546

CENTRIFUGAL EXTRACTOR

Pavel Semenovich Vlasov, ulitsa 25 let Oktyabrya, 26a, kv. 6; Alexandr Karlovich Ivanov, 2 Krasnodonsky pereulok 2, kv. 38; Erik Nikolaevich Svechnikov, ulitsa 25 let Oktyabrya, 28, kv. 13; Ivan Nikolaevich Sidorov, ulitsa Bogdana Khmelnitskogo 38, kv. 50; Nikolai Kuzmich Tjurin, 1 Krasnodonsky pereulok, 14, kv. 31; Valentin Ivanovich Boldov, ulitsa Alexandra Nevskogo, 4, kv. 7, all of Novosibirsk, and Vladimir Vasilievich Koloskov, I Peschany pereulok, 20, kv. 48, Moscow, all of U.S.S.R.

Filed July 10, 1973, Ser. No. 377,910
Int. Cl. B04b *11/06*
U.S. Cl. 233—10 **5 Claims**



1. A centrifugal extractor, comprising a horizontal hollow shaft; a rotor fixedly mounted on said horizontal hollow shaft; said rotor having end walls; a centrifugal chamber defined by a frusto-conical vessel mounted on said shaft coaxially therewith within said rotor; said vessel having end walls; a device feeding an initial product into said chamber, said feeding device being arranged within said hollow shaft; a device for distributing the initial product longitudinally of said chamber, said distributing device being provided on said hollow shaft within said centrifugal chamber; means for delivering the product obtained, including annular spaces arranged coaxially about said shaft intermediate of the respective end walls of said rotor and said centrifugal chamber; an additional annular space arranged coaxially about said shaft adjacent to the greater-diameter one of said end walls of said centrifugal chamber, within said chamber, said additional annular space presenting a vessel communicating with said centrifugal chamber; and stationary mixing means received inside said additional space.

3,905,547

CRIBBAGE BOARD

Ronald Eugene Cyre, P.O. Box 5587 Stn. L, Edmonton, and Roger Allan Cyre, P.O. Box 27, Fort Nelson, both of Canada

Filed July 23, 1974, Ser. No. 490,987
Int. Cl.² A63F *1/18*; **G06C** *3/00*
U.S. Cl. 235—90 **4 Claims**

1. A circular cribbage board comprising:

a. a circular base plate,

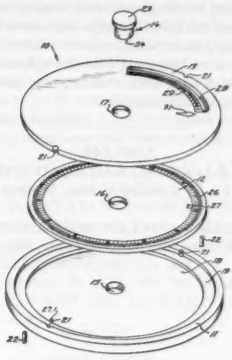
b. a circular counter disc mounted on the base plate for rotation,

c. a circular scale having 122 divisions numbered consecutively from 0 displayed on the counter disc,

d. the counter disc having a circular row of holes with one hole at each division of the scale,

e. a cover plate nonrotatably secured to the base plate over the counter disc having an arcuate slot aligned with the row of holes in the counter disc for enabling a sharp pointed instrument to be inserted into a selected hole for rotating the disc, said slot having a length such as to expose the 30 holes of the counter disc at one time,

f. a scale displayed on the cover plate adjacent the slot having divisions numbered from 0 to 29,



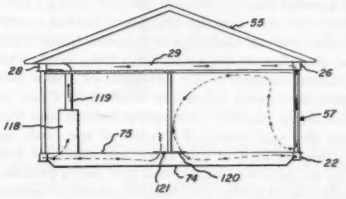
g. a registration mark displayed on the cover plate for indicating on the scale of the counter disc, a player's total score.

3,905,548

PREFABRICATED BUILDING CONSTRUCTION

James H. Brodie, 1972 Grand Ave., St. Paul, Minn. 55104

Division of Ser. No. 120,816, March 4, 1971, Pat. No. 3,771,273. This application Aug. 27, 1973, Ser. No. 391,638
Int. Cl.² F24D *5/04*, *5/10*
U.S. Cl. 237—69 **11 Claims**



1. A building construction comprising:

lower and upper horizontal frame members of a configuration corresponding to the desired floor plan of the building,

each of said frame members having peripheral frame elements which are structurally integral so that stresses applied at support points are transmitted and distributed throughout the periphery of each of said horizontal frames,

a plurality of parallel vertical posts supported at their lower ends by the ground and disposed so that they engage the outer peripheries of the frame members at a plurality of points,

and a plurality of clamping means for adjustably securing said upper and lower frame members to said vertical posts with said frame members spaced to provide the desired floor to ceiling spacing, said clamping means comprising a plurality of independently adjustable clamping devices to enable each horizontal frame member to be adjusted to assume a horizontal position regardless of whether the lower ends of said posts lie in a horizontal plane,

at least one of the peripheral frame elements of each of said frame members being in the form of a hollow beam with openings therethrough at longitudinally spaced points to allow the circulation throughout of a heat exchange medium,

the heat exchange medium comprising air and (in which there is) a panel assembly being disposed between said frame members, said panel assembly having spaced panels and being so disposed with respect to one of said hollow beam peripheral frame members that the space between said panels communicates with one of said longitudinally spaced openings therethrough so that air circulating through said hollow beam can pass through the space between said panels.

3,905,549

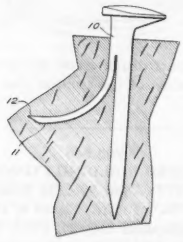
SELF-LOCKING RAILROAD SPIKE

John Walker, 33 El Camino Corto, Walnut Creek, Calif. 94598

Continuation of Ser. No. 314,805, Dec. 13, 1972, abandoned. This application May 22, 1974, Ser. No. 467,552

Int. Cl.[2] E01B *9/04*

U.S. Cl. 238—369 **1 Claim**



1. A railroad spike of conventional form of the type having a rigid, parallel shank, a head at one end having a rail-contacting projection, and a wedge-like point, having a cutting edge at the other end, the said edge of the point being normal to the angular direction of the projection of the head; wherein the improvement consists of the provision of a spur attached to said spike at a point below the head thereof and extending downwardly in parallel relationship thereto and terminating adjacent the said wedge-like point of the basic spike, the confronting surfaces of said spike and said spur being separated by an unbroken plane, said spur being provided with a wedge-like point having a cutting edge beveled from the inside only, the edges of both points being in parallel relationship; said spur being of relatively thinner form than the shank of the basic spike, the reduced thickness being parallel to the said edges of the wedge-like points; the two combined elements of the improved spike being so constructed and arranged that the spike, when driven in the usual manner, will penetrate a railroad tie, forming its own straight path normal to the surface thereof with a wedging action only in a direction longitudinal to the tie into which it is driven, while said spur, making its own individual and independent point of penetration, will follow a generally arcuate path in divergent relationship to that of the spike proper, said spur further providing a brace adapted to resist any forces tending to increase the fixed gauge of a railroad track.

3,905,550

AVOIDANCE OF SPATTERING IN THE SUPPLY OF CONDUCTIVE LIQUIDS TO CHARGED RESERVOIRS

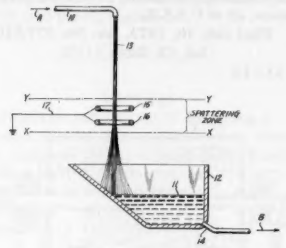
Abdullah M. Rokadia, Schaumberg, and Joseph E. Gaske, Mt. Prospect, both of Ill., assignors to De Sota, Inc., Des Plaines, Ill.

Filed June 6, 1974, Ser. No. 476,813

Int. Cl.[2] B05B *5/02*

U.S. Cl. 239—15 **10 Claims**

1. Apparatus for supplying uncharged electrically conductive liquid to an electrostatically charged electrically isolated reservoir thereof comprising, conduit means for supplying said liquid to said reservoir in the form of an unconfined column having a length which prevents the passage of an electrostatic charge back to said conduit means, an electrically isolated container positioned to receive said unconfined column of liquid to provide a reservoir of electrostatically charged liquid, said charged reservoir establishing an electrical field having an arcing level close to said reservoir and a spattering level further removed from said reservoir, said levels defining a spattering zone therebetween, said unconfined column of liquid passing through said field and through said spattering zone, and at least one grounded conductor surrounding said unconfined column and electrically proximate thereto within said spattering zone to dissipate the electrical field in said spattering zone in the vicinity of said unconfined column of liquid and thereby minimize loss of liquid from said unconfined column by spattering.



3,905,551

AUTOMATIC SOIL-SPRINKLING ARRANGEMENTS

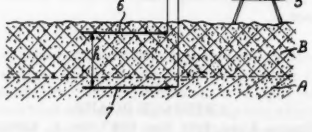
Charles Ayme de la Chevreliere, 21 Avenue de Madrid, Neuilly-sur-Seine (Hauts-de-Seine), France

Filed Mar. 18, 1968, Ser. No. 713,645

Claims priority, application France, Mar. 20, 1967, 67.99429

Int. Cl. A01q *21/18, 27/00*

U.S. Cl. 239—63 **2 Claims**



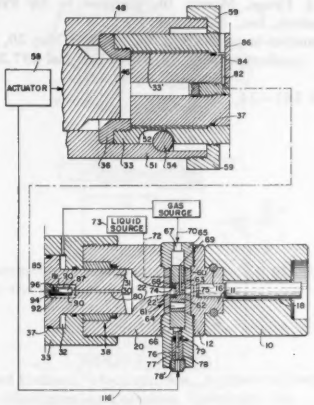
1. A soil moistening system, comprising in combination, a first isolated electrode, in an upper layer of the soil which is adapted to be moistened, a second isolated electrode in a lower layer of the soil which incorporated a permanent residual moisture, means for measuring the electrical resistivity of the soil between said electrodes and thereby the moisture content of the soil including circuit means connecting said electrodes to a source of electric power whereby to pass electric current from one electrode to the other through the soil between the electrodes, said means being operatively connected to the actuating means of a sprinkler system and being adapted to activate said sprinkler system until the moisture in said upper layer has sunk sufficiently for it to reach the upper surface of the lower soil layer which incorporates permanent residual moisture, said first and second electrodes being substantially spaced from each other in a horizontal direction.

3,905,552

APPARATUS FOR FORMING PULSED JETS OF LIQUID

J. Michael Hall, Annapolis, Md., and Louis L. Clipp, McLean, Va., assignors to Exotech, Incorporated, Gaithersburg, Md.

Filed Oct. 18, 1973, Ser. No. 407,485
Int. Cl.[2] B05B *01/08*
U.S. Cl. 239—101 7 Claims



1. Apparatus for forming pulsed jets of liquid comprising:

a nozzle block having a discharge opening therethrough and a valve bore therein transverse said nozzle block discharge opening to divide said nozzle block discharge opening into an inlet portion and an outlet portion;

a pressure cylinder cooperating with said nozzle block to define a compressible chamber in fluid communication with said nozzle block discharge opening inlet portion;

a valve body slidably mounted within said nozzle block valve bore and having therethrough a discharge opening, adapted to be positioned in line with said nozzle block discharge opening, and a gas opening, said gas opening having a first end adapted to be interconnected in fluid communication with said nozzle block discharge opening outlet portion and having a second end adapted to be connected to a source of gas; said valve body slidable within said valve bore between a first valve position, in which said valve body discharge opening is aligned with said nozzle block discharge opening to provide a discharge path for said compressible chamber and said gas opening is not interconnected with said nozzle block discharge opening outlet portion, and a second valve position, in which said valve body discharge opening is not aligned with said nozzle block discharge opening, thereby interrupting the compressible chamber discharge path, while said valve body gas opening first end is in fluid communication with said nozzle block discharge opening outlet portion;

liquid supply means for supplying liquid charge material to said chamber;

valve control means for controlling movement of said valve body between the first valve position and the second valve position;

gas source means connected to said nozzle block gas opening second end for supplying gas thereto;

bias means for normally urging said pressure cylinder from said nozzle block to enlarge said compressible chamber;

impelling means for rapidly acting on said pressure cylinder to compress said compressible chamber against the urging of said bias means and to expel liquid charge material from said compressible chamber out said discharge opening as a pulsed liquid jet, including means for selectively controlling operation of said valve control means to selectively cause:

a. the positioning of said valve body in the second valve position, when the impelling means is not acting on said pressure cylinder, to permit gas to pass from said gas source means through said valve body gas opening and out said nozzle block discharge opening outlet portion to remove liquid therefrom; and

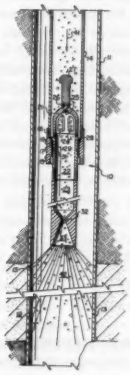
b. the positioning of said valve body in the first valve position prior to actual expulsion of the liquid charge from the chamber, upon activation of said impelling means to compress said compressible chamber.

3,905,553

MIST INJECTION METHOD AND SYSTEM

William S. Bradley; William C. Hardy, and James F. Lea, Jr., all of Richardson, Tex., assignors to Sun Oil Company (Delaware), Dallas, Tex.

Filed Aug. 3, 1973, Ser. No. 385,373
Int. Cl.[2] B05B *9/00*; E21B *43/25, 43/24*
U.S. Cl. 239—124 5 Claims



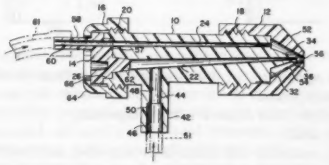
1. An injector for downhole mist generation including a section of tubing terminated at the lower end by a collar, said injector comprising: a dome-shaped inlet section having a plurality of apertures therein for admitting fluids; an intermediate section attached to the lower end of said inlet section and sealed to the interior of said collar; and an outlet section including a spray orifice for production of a mist from fluid flowing through said injector.

3,905,554

CONVERTIBLE LIQUID SPRAY NOZZLE

Jonathan Durand Bell, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 24, 1973, Ser. No. 409,190
Int. Cl.[2] B05B *07/06*
U.S. Cl. 239—424 2 Claims



1. A nozzle for paint spray gun operable by pressurized air, comprising:

an elongated body having a rear end and a front end which comprises a flat, circular face provided with a cone-

shaped extension centrally located on said face including a tip projecting forward from said face, said elongated body including a first tapered passage extending longitudinally therethrough from a first entrance opening in said rear end through said cone-shaped extension to a first exit opening in said tip of said cone-shaped extension and a second tapered passage extending longitudinally therethrough from a second entrance opening in said rear end to a second exit opening in said face, said body including a stem projecting laterally from said elongated body and including a passageway extending therethrough in fluid communication with said first tapered passage to provide said inlet port for supplying paint to said first tapered passage;

plug means for sealing said first entrance opening;

said elongated body further including an inlet port extending transversely therethrough in fluid communication with said first tapered passage for supplying paint to said first tapered passage to produce a flow of paint emerging from said first exit opening;

an air inlet in fluid communication with said second entrance opening for supplying pressurized air to said second tapered passage to produce a flow of air emerging from said second exit opening; and

a generally cylindrical cap removably mounted on said front end of said elongated body, said cap including a front wall provided with a cone-shaped interior surface which in cooperation with said face and said cone-shaped extension of said elongated body provides a chamber for mixing paint and pressurized air emerging from said first and second exit openings, respectively, said front wall of said cap including a central opening in front of and in axial alignment with said first exit opening in said tip of said cone-shaped extension to form a paint spray from paint and pressurized air supplied to said first and second tapered passages, respectively.

3,905,555
APPARATUS FOR DEPOSITING SOLID CARBON DIOXIDE

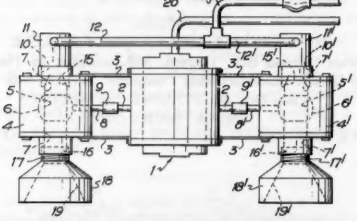
Henry Charles Gateshill, Rotherham, and Norris Wilfred Shepherd, Worksop, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 21, 1973, Ser. No. 427,398

Claims priority, application United Kingdom, June 1, 1973, 26349/73

Int. Cl.² B05B *01/30*

U.S. Cl. 239—573 **10 Claims**



1. An apparatus for the production of carbon dioxide snow which comprises:

a. a rotary ball control valve comprising

1. a seat,

2. a rotatable ball fitted into said seat, said ball having a through passage therein, and

3. a duct having substantially the same diameter as said through passage and being axially aligned with said through passage when said control valve is in an on position, and

b. a nozzle having a bore terminating in an outwardly expanding mouth, the adjacent end of which is connected upstream of said control valve.

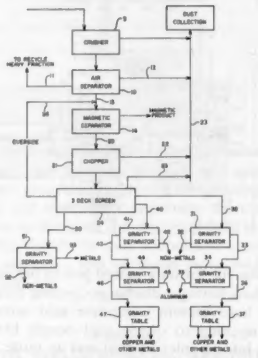
3,905,556
METHOD AND APPARATUS FOR RECOVERY OF METALS FROM SCRAP

David J. Drage, Monee, Ill., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 471,273, May 20, 1974. This application Aug. 14, 1974, Ser. No. 497,204

Int. Cl.² B02C *23/14*

U.S. Cl. 241—24 **14 Claims**



1. A method of recovering individual components from a previously comminuted scrap from which the original content of ferrous metal components has been at least largely removed, the steps of:

a. subjecting small pieces of such scrap to a chopping operation to reduce the pieces to smaller and more uniformly sized particles;

b. screening said particles to obtain a number of individual streams ranging in particle size from fine to coarse, each said stream being of narrow size distribution range;

c. and subjecting each such stream separately to density separation by pneumatic fluidization to separate each said stream into fractions of different density, at least one of said separated fractions being composed of materials of lower density than aluminum and at least one other of said separated fractions including non-ferrous metals higher in density than aluminum.

3,905,557
CRUSHING ROLLER MILL PROTECTIVE METHOD AND SYSTEM

Helmut Grommes, Duisburg, and Willi Lehr, Oberhausen, both of Germany, assignors to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed May 21, 1974, Ser. No. 471,966

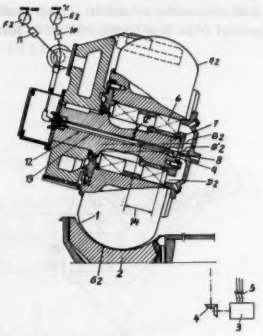
Claims priority, application Germany, May 24, 1973, 2326470

Int. Cl.² B02C *25/00*

U.S. Cl. 241—30 **10 Claims**

1. A method for monitoring and controlling the operation of a crushing roller mill of the type including a rotating horizontal plate having an annular grinding strip over which rol one or more non-orbiting crushing rollers rotatably mounted to shafts by means of bearings splash lubricated by oil contained in a sump within the crushing roller bearing housing comprising continuously measuring at least one of the temper-

ature and the level of the oil in the sump of at least one of the rollers, generating a signal related to at least one of the aforesaid measurements and stopping the operation of the mill in response to the signal generated.



3,905,558

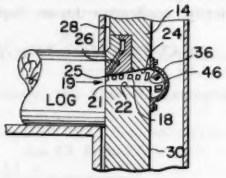
WOOD CHIPPER

W. Maynard Gaitten, Sylacauga, Ala., assignor to Soderhamn Machine Manfacturing Company, Talladega, Ala.

Continuation-in-part of Ser. No. 292,158, Sept. 25, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,255

Int. Cl. B02c *18/14*

U.S. Cl. 241—55 20 Claims



1. A wood chipper comprising:

a. a rotating cutting wheel having a front and rear face and a plurality of elongated and generally radially extending knives mounted on the front face of the wheel;

b. a housing surrounding said wheel and having inlet means for feeding lengths of wood against the face of the wheel to cut chips from the wood and outlet means for discharging chips from the housing;

c. elongated apertures in the front face of the cutting wheel extending along in front of the cutting edge of each of said knives so that the chips cut from the wood will pass through the apertures toward the rear of the cutting wheel; and

d. guide means covering the discharge side of each aperture and opening toward the periphery of the cutting wheel for receiving the chips passing through the apertures and directing them in a generally radial direction toward the periphery of the cutting wheel, said guide means having an inner curved surface with the inner surface of the trailing portion of the guide means being generally in alignment with the cutting edge of the knife so that the chips will be supported and will slide along one continuous smooth surface until they are discharged from the periphery of the cutting wheel to thereby minimize impact damage to the chips.

3,905,559

ARMOURED RING FOR DEFLECTING A DUST-GAS FLOW, IN ROLLER GRINDING MILLS

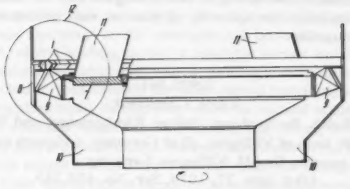
Horst Brundiek, Kaarst, Germany, assignor to Loesche Hartzerkleinerungs -und Zementmachinen KG, Dusseldorf, Germany

Filed Feb. 19, 1974, Ser. No. 443,792

Claims priority, application Germany, Feb. 28, 1973, 2309900

Int. Cl.² B02C *15/00, 23/34*

U.S. Cl. 241—59 8 Claims



1. An armoured ring for deflecting the dust-gas flow at the external edge, of a grinding pan, forming the external upper lateral termination of the trajectory of the material for grinding, in roller grinding mills, characterised in that the cross section of the armoured ring consists of two trapezoidal shaped figures with their major bases placed together, and as a result two surfaces are produced extending outwards and inwards and forming externally and internally a respective projecting edge.

3,905,560

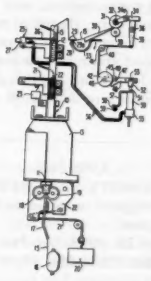
YARN WINDING MECHANISM

Alexander L. Trifunovic, Wilmington, Del., and William H. Hills, Melbourne Village, Fla., assignors to Joseph Bancroft & Sons Co., Wilmington, Del.

Division of Ser. No. 338,048, March 5, 1973, Pat. No. 3,837,053, which is a continuation-in-part of Ser. No. 225,553, Feb. 1, 1972, abandoned. This application May 6, 1974, Ser. No. 467,153

Int. Cl. B65h *54/02, 63/00*

U.S. Cl. 242—18 DD 23 Claims



1. A winding mechanism for withdrawing yarn or the like from a treating chamber comprising:

a driving roll element driven in rotation by a driving means,

a rotatable yarn winding element upon which treated yarn is wound, at least one of said elements being movable with respect to the other of said elements,

a control means for varying the spacing between said yarn winding element and said driving roll element between the limits of full engagement and complete disengagement with one another, said control means comprising:

a rotatable drum means,

control linkage means connected on the one hand to said movable element and on the other hand to said drum means at a point spaced from the axis of rotation of said drum means so that rotation of said drum means causes movement of said linkage means,

sensing means for sensing a predetermined quantity of treated yarn to be wound on said winding element, and means for rotating said drum means in response to said sensing means, whereby said drum means is rotated to operate said linkage means to vary the spacing between aid winding element and said driving roll element, thereby increasing or decreasing the rate of winding to maintain the quantity of yarn at said predetermined quantity.

3,905,561

TAPE CARRIER

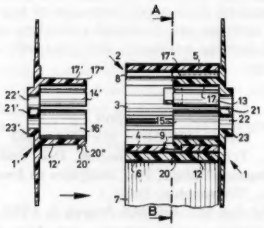
Heinz Kelch, Buchenberg; Hilmar Kirchgessner, and Eduard Schuh, both of Villingen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed Mar. 27, 1974, Ser. No. 455,283

Claims priority, application Germany, Mar. 29, 1973, 7311896

Int. Cl. B65h *75/18*

U.S. Cl. 242—71.8 **18 Claims**



1. Tape carrier, comprising a hollow core having a substantially cylindrical outer surface for winding a tape thereon, and an inner wall portion generally coaxial with said outer surface; at least one flange member having a section extending radially outwardly from said outer surface, and a mounting portion received in said hollow core; abutment means on one of said portions; and latching means on the other of said portions and adapted to engage said abutment means with a snap action upon insertion of said mounting portion into said hollow core and operative for connecting said flange member to said hollow core.

3,905,562

VEHICLE SAFETY BELT RETRACTORS

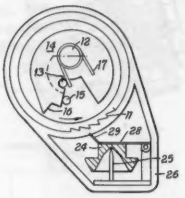
John Kell, Carlisle, England, assignor to Kangol Magnet Limited, London, England

Filed May 25, 1973, Ser. No. 364,069

Int. Cl.[2] B65H *75/48*

U.S. Cl. 242—107.4 **9 Claims**

1. A vehicle seat belt retractor comprising a housing, s shaft rotatably mounted in the housing, a seat belt having an end thereof secured to the shaft, spring means urging the shaft to rotate to wind the belt thereon, a flywheel member carried on an end of the shaft so as to rotate therewith during rotation of the shaft in the belt unwinding direction below a predetermined speed and so as to lag behind said shaft by rotation relative thereto when said predetermined speed is exceeded, a hub protruding eccentrically from said shaft end, a plate-like pawl member pivotably carried on said hub axially adjacent said flywheel member and having a peripheral recess, a tooth portion on said pawl member, tooth means carried by said housing and located around and radially outwardly of the pawl member, axially extending abutment means on said flywheel member extending into the peripheral recess of said pawl member for engagement therewith, and resilient means maintaining said pawl and flywheel members in a relative position defined by said abutment means in which position the tooth portion is spaced from the tooth means as long as the shaft



rotates in the belt unwinding direction below said predetermined speed, said resilient means permitting pivoting of the pawl member on said hub but responsive to lagging of said flywheel member behind said shaft when said speed is exceeded to bring said tooth portion into engagement with said tooth means and thereby check rotation of said shaft in said direction relative to said tooth means.

3,905,563

SYSTEM FOR CONTROLLING A MISSILE MOTION IN THE HOMING MODE

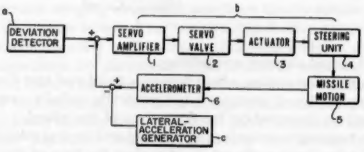
Saburo Nagoshi, Tokyo, Japan, assignor to Fuji Heavy Industries Ltd., Tokyo, Japan

Filed Apr. 25, 1973, Ser. No. 354,386

Claims priority, application Japan, Sept. 28, 1972, 47-97345

Int. Cl. F42b *15/02*; **F41g** *7/00*

U.S. Cl. 244—3.15 **8 Claims**



1. A system for guiding an in-flight homing missile to a target, comprising:

sighting means for tracking the location of a line of sight from the missile to the target;

detector means responsive to said sighting means for generating an error signal depending upon any deviation of the missile flight path from said line of sight;

steering means for changing the course of the missile;

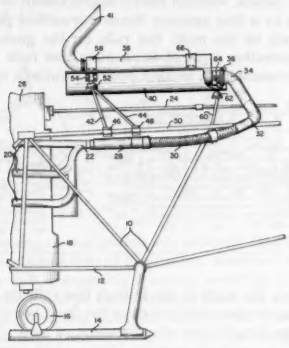
control means for said steering means connected to said detector means for delivering a corrective signal derived from said error signal to said steering means; and

biasing means connected to said control means for superimposing upon said corrective signal to a lateral-acceleration signal effective in a direction perpendicular to an invariable reference direction generally parallel to said flight path.

3,905,564
HELICOPTER MUFFLER SYSTEM

Roland V. Furlano, 10832 Yarmouth, Granada Hills, Calif. 91344

Filed Apr. 1, 1974, Ser. No. 456,463
Int. Cl.² B64C 27/00; F01N 7/00
U.S. Cl. 244—17.11 6 Claims

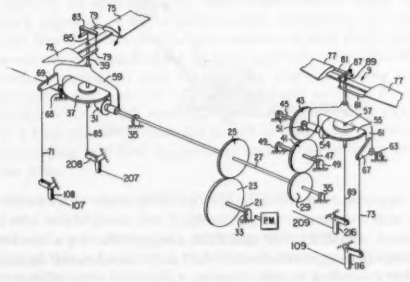


1. An exhaust system for a helicopter comprising a helicopter having rear frame support struts, flexible tubing leading from the exhaust of the helicopter engine, a Y shaped exhaust manifold adapted to receive said flexible tubing, a single outlet from said Y shaped tubing, a muffler fixedly attached to said outlet, side and rear support struts for securely attaching said muffler to the rear helicopter frame, a fire shield surrounding the lower portion of said muffler for protection from the helicopter engine, and shock mounts for mounting the muffler to the support struts.

3,905,565
TILT AXIS DUAL ROTOR HELICOPTER AND CONTROL SYSTEM

Herman Gopp Kolwey, 103 Elm Ct., Lexington Park, Md. 20653

Filed Sept. 27, 1973, Ser. No. 401,149
Int. Cl. B64c 27/08
U.S. Cl. 244—17.23 4 Claims

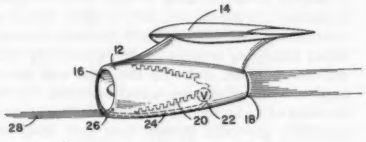


1. In a tandem helicopter aircraft, a pair of identical sustaining rotors; a pair of tiltable mast means, pivot means including non-rotatable yoke means pivoted to the helicopter air frame on longitudinal axes which are parallel to the longitudinal axis of the aircraft mounting said masts for tilting only about axes parallel to the longitudinal axis of said aircraft; drive means for said rotors, said drive means including rotatable shafts supported at one end by said yoke means for pivotal movement about said parallel axes, each of said rotors being pivotally connected to each of said shaft means for tilting about an axis normal to the axis of rotation of said shaft means, a power source and means connecting each of said shafts to the power source at pivotal axes of said yoke means for transmitting equal power from the power source through said shafts to each of said rotors in any and all positions of said rotors about their respective tilt axes; said connecting means comprising at least one horizontal shaft passing through the yoke means along an axis coincident with the pivotal axis of said yoke means; control means directly connected to said yoke means for tilting each of said entire mast means about their respective tilt axes, to provide control of said aircraft about two axes, yaw, roll and indirectly sideward velocity in all flight modes, said control means including pilot operated control input members operated in the conventional controlling mode, a linearly movable slide means, a rotatable means mounted on said linearly movable slide means, motion transmitting means connected to said linearly movable means providing a linear reciprocative input thereto responsive to manual actuation of a pilot operated input control; motion translating means including said rotatable means whereby said input to the linearly movable means is translated into simultaneous tilting of said masts from side to side in opposite directions responsive to the direction of motion of said linearly movable means, a pilot operated input member connected to said rotatable means carried by said linearly movable slide means whereby said rotatable means may be rotated in either direction, the output from said rotatable means being translated into simultaneous tilting of said masts in the same direction and the sum total of the tilting of said rotor masts is an integrated function of the pilot operated input members, providing inputs to either or both of said linearly moveable slide means or said rotatable means.

3,905,566
JET ENGINE INTAKE PROTECTION SYSTEM

Edwin R. Anderson, 417 Clintwood Ave., La Puente, Calif. 91744

Filed Aug. 29, 1972, Ser. No. 284,569
Int. Cl.² B64D 33/02
U.S. Cl. 244—53 B 3 Claims



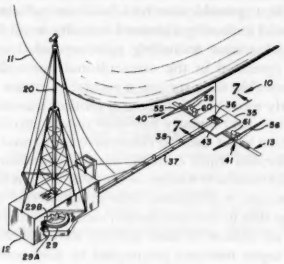
1. A jet aircraft provided with a jet engine, the lengthwise dimension of said jet engine being fixedly generally parallel to the lengthwise dimension of said aircraft, said jet engine having a forward intake end, a rear exhaust end, and means for forming a fluid barrier in proximity to the lower leading portion of the forward intake end, said fluid barrier moving forwardly of said intake end and generally below and parallel to the direction of the flow of air into said intake end to prevent the ingestion of particulate matter into said engine, a vortex being generated when said engine is in operation from a point below said engine upwardly to said forward intake end, said means for forming a fluid-barrier comprising a plurality of forwardly facing openings in said lower leading portion and means for producing a flow of high pressure gases therethrough to form said fluid barrier which interdicts the upward movement of particulate matter in said vortex, said engine being carried in a pod beneath the wings of said aircraft, said engine being a fan jet and said means for forming includes two sets of orifices, one set at the lower edge of the main engine inlet and the other set at the lower leading edge of the pod.

3,905,567

MOORING SYSTEM ARRANGEMENT FOR BLIMP-SHAPED TETHERED BALLOONS

James A. Menke, Shakopee, and Eugene L. Haak, Northfield, both of Minn., assignors to G. T. Schjeldahl Company, Northfield, Minn.

Filed Mar. 13, 1974, Ser. No. 450,603
Int. Cl.[2] B64F 1/14
U.S. Cl. 244—115 4 Claims



1. Mooring means for aerodynamically-shaped tethered balloons comprising:

a. base mounting means including a frame means, mooring mast means secured to said frame means and comprising a turntable rotatable about the central axis thereof, a generally upright extensible and retractable rotatable mooring mast having a balloon coupling member adjacent the outward free end thereof for releasably securing a tethered balloon to said free end, and an endless circular rail disposed radially outwardly of said mooring mast, with said mooring mast being disposed at the center of said endless circular rail and having means for extension and retraction thereof;

b. a radially extending generally horizontally disposed boom extending outwardly from said turntable and having boom coupling means at the free end thereof with wheel elements secured to the base of said boom coupling means and being disposed upon said endless circular rail;

c. sheave means secured to said boom coupling means including a flying sheave with a tether line in operative relationship therewith and with the outer free end of said tether line being arranged to be operatively secured to a tethered balloon, and with the inner end thereof being captive with winch means and operative for controlled mooring of said tethered balloon, said flying sheave being operative generally intermediate said inner and outer ends, and a pair of laterally and outwardly disposed handling lines disposed laterally of said flying sheave, each of said handling lines having one end operatively coupled to said circular rail and with the opposed ends arranged to be coupled to opposed lateral side wall surfaces of a tethered balloon, with said handling lines being arranged to secure a tethered balloon to means supported upon said circular rail.

3,905,568

MOVABLE GIRDER TYPE HIGH SPEED TURNOUT DEVICE

Yusaku Watanabe; Masayuki Ikemori, and Tuneharu Kitakata, all of Tokyo, Japan, assignors to Japanese National Railways, Tokyo, Japan

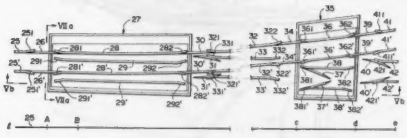
Filed Apr. 29, 1974, Ser. No. 465,365
Claims priority, application Japan, Apr. 28, 1973, 48-47367
Int. Cl.[2] E01B 7/00
U.S. Cl. 246—430 9 Claims

1. A movable girder type high speed turnout device for switching a track between main line and branch line rails comprising:

a. girder means which are movable right or left to the longitudinal direction of the rails;

b. a plurality of rails laid on said girder means forming portions of said main line and branch line; and,

c. movable rail means for connecting the ends of the rails laid on said girder means with the opposed ends of the main line rails and the branch line rails laid adjoining said girder means, wherein lateral displacement of said girder means to a first position forms a specified gap between the ends of the main line rails on the girders and the corresponding ends of fixed main line rails and lateral displacement to a second position forms a specific gap



between the ends of the branch line rails on the girders and the corresponding ends of the fixed branch line rails; and the longitudinal displacement of said movable rail means to a third position closes said specified gaps thereby forming a main line route of the main line rails laid on the girders facing the corresponding ends of the fixed main line rails, and the longitudinal displacement of said movable rails to a fourth position closes said specified gaps thereby forming a branch line route of the branch line laid on the girders facing the corresponding ends of the fixed branch line rails, whereby a main line route or branch line route can be formed.

3,905,569

APPARATUS FOR CHANGING THE POSITION OF A MANIPULATOR ARM

Makoto Ohnaka, Yokohama, Japan, assignor to Shiroyama Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed July 10, 1974, Ser. No. 487,065
Claims priority, application Japan, Apr. 8, 1974, 49-39956
Int. Cl.[2] F16F 15/00; F16M 1/00
U.S. Cl. 248—16 2 Claims

1. Apparatus for changing the operating angle of a manipulator arm comprising a slide on which said manipulator arm is mounted, a shaft fixed to said slide, a support having a bracket with an opening in which said shaft is received, a slot in said bracket extending to said opening, a threaded element in said bracket operable to apply and release a force to said slot whereby said shaft is accordingly tightly gripped or loosely disposed in said opening, a forked member, means fixedly mounting said fork member on said shaft adjacent to said bracket, said forked member having two spaced legs, a receiving member fixed to said bracket, said receiving member projecting from said bracket in an axial direction to a position between the spaced legs of said forked member, movable elements threadedly engaged in each of said spaced legs and operable to engage said fixed receiving member to thereby adjustably rotate said shaft in said bracket when said threaded

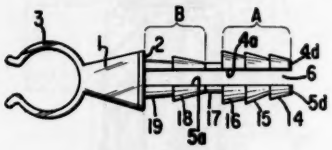
element has released said force to said slot and said shaft is loosely held in said opening in said bracket.

3,905,570

RESILIENT FASTENING DEVICES

Aril J. Nieuwveld, Herungerweg 379, Venlo, Netherlands

Filed Nov. 27, 1972, Ser. No. 309,731
Int. Cl. F16b *15/02*
U.S. Cl. 248—71 5 Claims



1. A fastening device mountable securely simply by being thrust by hand into a hole of appropriate diameter, such as one drilled in a wall, comprising a unitary molding of a resilient synthetic resin material constituting a head and a plurality of resilient legs projecting from and held by said head in spaced apart substantially parallel relation, said legs being elastically deflectable laterally independently of each other and into the space between them so that each leg will exert a reactive force by its resiliency upon being deflected laterally from its normal posture relative to said head, the confronting inner surfaces of said legs normally being substantially flat and straight and substantially parallel, each of said legs comprising outwardly directed protrusions spaced apart therealong, the diametrical distance between the outer edges of the respective protrusions of said legs in a direction across the space between the legs normally being substantially greater than said hole diameter yet, upon said legs being pressed together, being at most slightly greater than said hole diameter at locations where the legs butt each other, so that the legs can fit into the hole, said legs being sufficiently resilient that upon being thrust together into the hole at least some of their protrusions will press outwardly and grip against the wall of the hole, each of said legs comprising forward and backward sections thereof interconnected by an intermediate segment thereof, each said backward section being constituted by several segments of approximately semi-frusto-conical shape joined together coaxially with their respective bases facing away from the free end of the leg, each said forward section being constituted by a first segment of approximately semi-frusto-conical shape and a neck segment of lesser radial extent connecting the base of said first segment with a base portion of said head, said leg protrusions being formed by said approximately semi-frusto-conical segments, said intermediate segments being readily severable for removal of said backward sections from the device whereby the remnant device may be readily mounted in a hole shallower than the length of said neck segments by converging said first segments in and thrusting them through the hole.

3,905,571

NURSING BOTTLE HOLDER

Joseph Lombardo, 2319 S. Goebert, Arlington Heights, Ill. 60005

Filed Mar. 26, 1971, Ser. No. 128,253
Int. Cl.[2] A47D *15/00*
U.S. Cl. 248—102 1 Claim

1. As a new article of manufacture, a nursing bottle holder adapted to be inflated and also expressly to hold an infant's nursing bottle in a feeding position while the infant is lying in a prone position, said holder comprising a hollow member which is formed of comparatively thin flexible plastic sheet material of uniform thickness throughout and assumes the form of a diabolo having bulbous convex end walls which form the large bases of a pair of intercommunicating frusto-conical holder sections, said sections having a slant angle in the range of 20° to 45° and being joined together in end-to-end relationship at their small bases to provide a small-diameter junction region which is circular in transverse cross section, the inflated holder being of such proportions that it is adapted for positioning on the chest of the infant with said bulbous end

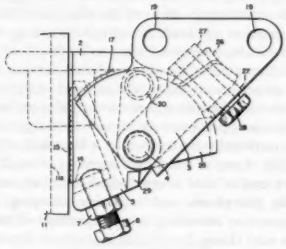
walls disposed in the vicinity of the armpits and with said small-diameter junction region centered on the infant's chest, whereby the nursing bottle may rest tangentially and transversely on the holder for nipple-reception in the infant's mouth in all rotational positions of the holder, one of said bulbous end walls being provided in its central portion with a valve-equipped opening whereby the holder may be inflated and deflated at will.

3,905,572

CLAMPING MECHANISM FOR PLATFORM

Akio Hikai; Yoshiyuki Kobayashi, and Kazuyoshi Furuta, all of Shizuoka, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 319,767, Dec. 29, 1972, Pat. No. 3,837,606. This application May 31, 1974, Ser. No. 474,973
Claims priority, application Japan, Dec. 29, 1971, 47-2639
Int. Cl.[2] E04G *3/02*
U.S. Cl. 248—242 1 Claim



1. A device for supporting a scaffolding workplank (12) comprising in combination:

a. a supporting body (1) with an outer supporting portion and an inner clamp portion (2) for clamping onto a flange (11*a*) a lower cotter receiver aperture (5*a*) in said body;

b. a cross-arm (3) pivotally coupled to said outer supporting portion on a pivot shaft (4), a first adjustment screw bolt (8) away from said pivot shaft (4) connecting said body (1) and said cross-arm (3) for threaded adjusting of the position of said cross-arm;

c. a cotter wedge (14) in said cotter receiver aperture (5*a*) with an elongated outer engaging side having teeth (15) thereon for engaging a structure wall and a second adjustment screw bolt (6) connected to said body and said cotter for threaded adjusting of the contact of said cotter teeth (15) with the structure wall;

d. a third adjustment screw bolt (16) in said body disposed perpendicular to said second screw bolt (6) for engaging said cotter wedge (14); and,

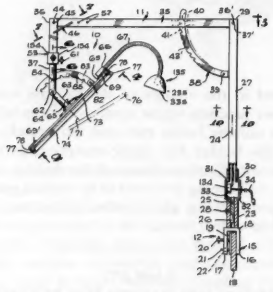
e. a first and second worm wheels (25, 26) in engagement with said body, and grip means (28) to turn said second worm wheel (26), the rotation of said grip means causing rotation of said first worm wheel (25) pivoting said cross-arm (3) around said pivot shaft (4).

3,905,573

ADJUSTABLE READING AID

James M. Davis, 6723 Fifth Ave., Los Angeles, Calif. 90043

Filed Nov. 9, 1973, Ser. No. 414,374
Int. Cl.[2] A47B *23/00*
U.S. Cl. 248—445 2 Claims



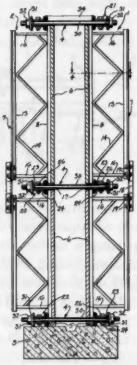
1. A reading aid comprising a unit for detachably holding reading material; and an elongated structure supporting said unit and having a mounting portion at a first end thereof; said elongated structure being connected at a second end thereof to said unit, and being adjustable between said ends to different conditions supporting said unit and reading material carried thereby in any of various different reading positions relative to said mounting portion of the elongated structure; said mounting portion of said elongated structure including a downwardly facing clamp adapted to be received over and be clamped to the upper edge of a bed headboard or the like; said elongated structure including a first rigid member projecting upwardly above said clamp, a second rigid member connected pivotally to an upper portion of said first rigid member and projecting outwardly therefrom to a location offset horizontally from the clamp, a third rigid member pivotally connected to an outer end of said second rigid member and projecting downwardly therefrom and adjusting carrying said unit, a swivel connection attaching a lower portion of said first rigid member to said clamp for pivotal movement about a generally vertical axis to swing said members and said unit and carried reading material between an active reading position and an inactive retracted position, a fourth member projecting downwardly from said third member, a second swivel connection attaching said fourth member to said third member to turn relative thereto about a generally vertical axis, and a pivotal connection attaching said unit to said fourth member for pivotal adjusting movement about a generally horizontal axis; said unit including a backing structure against which a book is receivable in open condition, an elongated retaining element adapted to extend between successive pages of the book at a location opposite the binding to retain the book against said backing structure, two springs securing opposite ends of said retaining element to the backing structure beyond the binding of the book, and elastic corner retainers carried by said backing structure at locations to extend across different corners of the pages of the book and releasably retain them in open condition.

3,905,574

CONCRETE FORMING SYSTEM

Robert C. Brauer, Wauwatosa, Wis., assignor to O'Brien & Brauer Construction, Inc., Brookfield, Wis.

Filed Mar. 13, 1973, Ser. No. 340,697
Int. Cl.[2] E04G *11/08, 17/06*
U.S. Cl. 249—45 9 Claims



1. In a concrete forming system, a pair of panels having adjacent edges spaced apart to provide an elongated gap therebetween, a series of truss assemblies secured edgewise to the outer surface of each panel and extending generally normal to said gap, the ends of said truss assemblies terminating adjacent said gap, and reinforcing means disposed generally parallel to said gap, said reinforcing means comprising a pair of spaced reinforcing members, with one of said reinforcing members being secured to the truss assemblies associated with one of said panels and the other of said reinforcing members being secured to the truss assemblies associated with the other of said panels, the space between said reinforcing members being aligned with said gap.

3,905,575

THREE STAGE SOLENOID OPERATED VALVE ASSEMBLY

Kenneth W. Zeuner, Newtown, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Filed Mar. 20, 1974, Ser. No. 453,060
Int. Cl.[2] F16K *31/383*
U.S. Cl. 251—30 13 Claims

1. A three stage normally closed valve assembly for providing a substantially high speed third stage opening for a substantially high volume of upstream fluid flow from an inlet into an outlet comprising

a first stage solenoid operated poppet valve assembly normally maintained closed for controlling flow of fluid through a second of said three stages,

an orifice for a second of said stages,

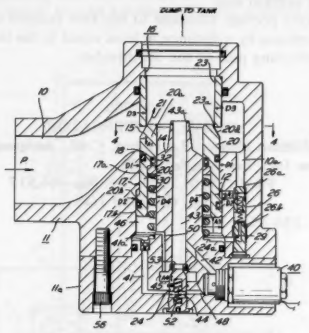
second stage poppet means movable between a second stage valve normally closed state seating in and closing said second stage orifice and a valve open state,

flow passage extension means in fluid communication with said second stage orifice for providing fluid flow from said second stage orifice into said outlet of said valve assembly during said second stage valve open state,

a third stage orifice opening directly into said outlet,

third stage poppet means movable between a valve normally closed state seating in and closing said third stage orifice and a valve open state, said third stage poppet means

having a longitudinal opening throughout its length for receiving therein said flow passage extension means said



flow passage extension means having one end rigidly secured with respect to said second stage orifice and having the other end floating and nonfixed.

3,905,576

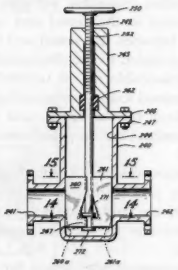
VALVES WITH LOW OPENING AND CLOSING GATE FRICTION AGAINST THE SEATS

Carl B. Fox, Jr., 1240 Post Oak Tower, 5051 Westheimer, Houston, Tex. 77027

Continuation-in-part of Ser. No. 35,134, May 6, 1970, abandoned. This application Sept. 12, 1972, Ser. No. 288,372

Int. Cl. F16k *3/18*

U.S. Cl. 251—327 **13 Claims**



1. Valve of the type for use in piping and plumbing systems and pipelines, comprising a valve body, said valve body being hollow to form an enclosed valve chamber therewithin and having two flow ports therethrough extending from the exterior of said valve body to opposite sides of said chamber, a pair of gate means in said chamber each having a surface adapted to seal against an interior surface of said valve body around the chamber end of one of said flow ports to close the flow port, a valve stem opening through said valve body transverse to said flow ports having packing means therearound, a valve stem longitudinally slidably and sealedly disposed through said stem opening and packing means and connected to said gate means, longitudinal movements of said valve stem moving said gate means between a valve closed position covering said chamber ends of said flow ports and a valve open position exposing said chamber ends of said flow ports, each said gate means having a trailing lower end portion to which said valve stem is connected which is flexibly bendable away from said interior surface of said valve body around said chamber end of one of said flow ports upon initial movement of said gate means from said valve closed position to at least partially crack open said flow ports, said flow ports being open unobstructed passages having no supports thereacross for said gate means, each of said gate means having reinforcing means transverse to the direction of bending of said gate means upon initial opening movement to prevent bending of said gate means in said transverse direction.

3,905,577

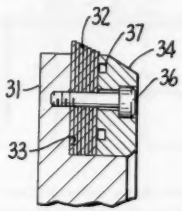
VALVE

Anatole N. Karpenko, San Francisco, Calif., assignor to Anchor/Darling Valve Company, Hayward, Calif.

Continuation-in-part of Ser. No. 339,113, March 8, 1973. This application July 9, 1973, Ser. No. 377,425

Int. Cl. F16k *25/00*

U.S. Cl. 251—357 **2 Claims**



1. An annular valve member having an annular, peripheral recess therein defining an axially facing shoulder at the periphery of the valve member and a reduced diameter axially projecting boss at the center of the valve member, and a seating member secured in said recess in engagement with said shoulder for cooperation with a valve seat, said seating member comprising a plurality of thin, annular, flat metallic rings all having the same inside diameter and having different outside diameters, the inside diameter of the rings being substantially the same as the inside diameter of the shoulder, said outside diameters of adjacent rings decreasing as the axial distance of the rings from the shoulder increases, the annular peripheries of at least those rings closest the shoulder projecting radially outwardly beyond the periphery of the valve member, a plurality of circumferentially spaced rivets extended axially through said rings fixing the rings in assembled relationship for assembly of the rings as a unit to the valve member, an annular retaining ring having an inner diameter the same as the inner diameter of the rings and an outer diameter substantially the same as the outer diameter of the shoulder and disposed in said recess axially outwardly of said rings and in clamping relationship with said rings, and a plurality of removable fastening means extended through said retaining ring and through aligned openings in said rings into the valve member to removably secure the retaining ring and metallic rings in operative position in said recess.

3,905,578

SAFETY BINDER

Leon Watson, Sr., 6018 Bowie St., Shreveport, La. 71108

Filed June 3, 1974, Ser. No. 475,517

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—75 **2 Claims**

1. A safety binder comprising:

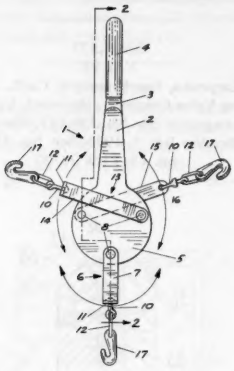
a. A frame having a handle at one end thereof and a bifurcated disk opposite and in cooperation with said handle;

b. A forward clevis in pivotal cooperation with the outside surfaces of said bifurcated disk near the periphery of said bifurcated disk and in alignment with and directly opposite said handle;

c. A rear clevis spaced about 120° from said forward clevis in pivotal cooperation with the outside surfaces of said bifurcated disk and spanning said bifurcated disk;

d. A rear pivot bar spaced about 120° from said forward clevis and said rear clevis in pivotal cooperation with the

inside bifurcated periphery of said bifurcated disk and pivotally disposed in crossed relationship with said rear clevis;



e. Means in cooperation with the free ends of said forward clevis, said rear pivot bar and said rear clevis for sequentially connecting said free ends to a load-engaging binder.

3,905,579

ELEVATING EQUIPMENT FOR LOADS SUCH AS PREFABRICATED FLOOR SECTIONS

Barbu Eugeniu Paladian, Boulogne sur Seine, France, assignor to Societe d'Etudes de Constructions et Travaux (SECTRA), Chambery, France, a part interest

Filed Mar. 11, 1974, Ser. No. 450,041

Claims priority, application France, Mar. 14, 1973, 73.09171

Int. Cl.[2] B66F *1/00;* **E02D** *21/00*

U.S. Cl. 254—105 **6 Claims**

1. In elevating equipment

a vertical elongate member,

drive means mounted at the top of the elongate member,

a lift member in driving engagement with the drive means and arranged to be attached to a load to be elevated, and guide means along the length of the vertical elongate member, secured thereto at a predetermined level and serving to guide the lift member; said lift member comprising

a first part,

a second part in end-to-end relationship with the first part, and

a connecting part securing the first and second parts together, and wherein

said guide means comprises

a first portion and

a second portion identical to the first portion and spaced therefrom by a distance at least equal to the length of the connecting part of the lift member.

3,905,580

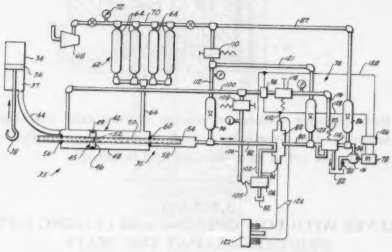
HEAVE COMPENSATOR

David William Hooper, La Habra, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Filed Oct. 9, 1973, Ser. No. 404,617

Int. Cl. B66d *1/48*

U.S. Cl. 254—172 **18 Claims**



1. Motion compensating apparatus useful to maintain a substantially constant support force on an article suspended from a floating vessel by a vertical support member despite heaving movement and the like of the vessel in response to wave action and the like, the apparatus comprising:

displaceable means engagable between the vessel and the support member at the vessel and operable for varying the distance between the vessel and the article;

passive means coupled to the displaceable means for operating the displaceable means to establish in the support member a desired load corresponding to a desired value of support force for the article and to maintain the desired load constant within preselected limits of variation thereof; and

active assist means coupled to the displaceable means and responsive to predetermined excursions in the desired load for actively and additively assisting the passive means to maintain the desired load within said preselected limits.

17. A heave compensating device for maintaining a load suspended from a floating platform at a substantially constant level comprising a passive load-supporting system including a resilient load-supparting bi-directionally movable connection attachable between a fixed support on a floating platform and the load to be supported, said passive system being capable of being set to exert continuously on said connection a desired load-supporting force, and an active force modifying system operative to sense a deviation from said desired load-supporting force to arithmetically assist directly the passive system to cause said deviation to tend toward zero.

3,905,581

LINE TRANSFERRING DEVICE

William H. Chadwick, Jr., Rossville, Ga., assignor to Sherman & Reilly, Inc., Chattanooga, Tenn.

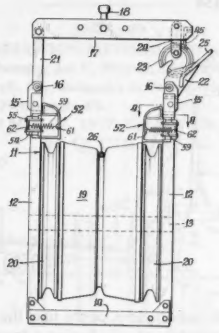
Filed Apr. 17, 1974, Ser. No. 461,505

Int. Cl.[2] B66D *1/36*

U.S. Cl. 254—193 **19 Claims**

1. Line-transferring means for connecting the upper end of an outer frame member and head bar means of a closed-head bundle conductor stringing block having a pulling line sheave and conductor stringing sheave means coaxially mounted

therein, comprising a housing for attachment to the upper end of said outer frame member and defining an arcuate trackway, a carrier wheel having circumferentially disposed bearing means cooperating with said trackway to enable rotation of said wheel relative to said housing, whereby rotation of said



wheel allows lateral transfer of the line from the exterior to the interior of said frame while continuously permitting a closed-head condition of the block during said line transfer, and suspension means depending from said head bar means for rotatably supporting said wheel.

3,905,582

FOAMED MATERIAL MOLDING HEAD

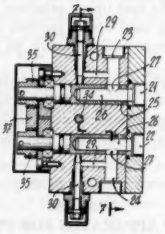
Carlo Fiorentini, Via Grossi, 10, Saronno (Varese), Italy

Filed Nov. 23, 1973, Ser. No. 418,214

Claims priority, application Italy, Dec. 14, 1972, 32898/72

Int. Cl. B01F *5/00*

U.S. Cl. 259—4 **6 Claims**



1. A mixing and molding head for foamed material, as obtained from a chemical mixture of components interracting in stoichiometrically metered amounts for providing said foamed product, comprising: a head body having a mixing and outlet conduit for the passage of such components to a mold; first and, at least, second component injecting nozzles converging to each other in said mixing conduit; an inlet conduit and a relative recycling outlet conduit for each of the mixture components for the recycling outlet thereof, and a bypass passage branchable off between each inlet conduit and the relative recycling outlet conduit, the latter having at least at one location thereof a minimal cross-section for the passage of the material stream, different from the minimal cross-section of said recycling conduit; said head also including valve means operable for directly connecting each of the inlet conduits with the associated injection nozzle and the recycling conduit associated therewith, respectively, as well as for indirectly connecting said inlet and recycling conduits through said bypass passage for recycling according to a first pressure rate and respectively for recycling according to a second pressure rate different from the first pressure rate.

3,905,583

METHOD AND DEVICE FOR THE FABRICATION OF IMPROVED PLASTIC AND CELLULOSE FILMS

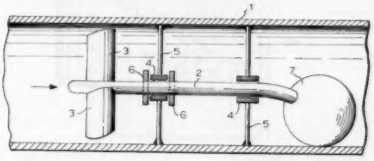
Francois Charles-Messance, and Ernest Collobert, both of Mantes La Jolie, France, assignors to La Cellophane, Paris, France

Filed Nov. 9, 1973, Ser. No. 414,252

Claims priority, application France, Nov. 15, 1972, 72.40454

Int. Cl.² B01F *5/16*

U.S. Cl. 259—8 **15 Claims**



1. A method to randomize the across machine direction inequalities in thickness of cellulosic films obtained from the extrusion of viscose threads through an extrusion hopper wherein the viscose threads are fed to the extrusion hopper through a supply conduit, said viscose threads being obtained from the coagulation of viscose threads in an acid bath comprising the continuous randomization of said viscose threads within the supply conduit to the extrusion hopper wherein the randomization occurs as a result of the movement of a mobile body in contact with the inside wall and about the axis of the supply conduit.

3,905,584

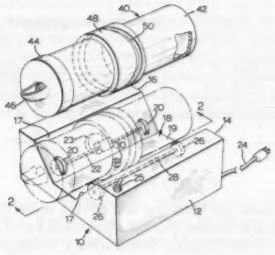
DEVICE FOR LIQUID PROCESSING

Simon Ratowsky, Downsview, Canada, assignor to Monrick Holdings Limited, Downview, Canada

Filed Dec. 26, 1973, Ser. No. 427,798

Int. Cl.² B01F *9/02, 11/00*

U.S. Cl. 259—72 **8 Claims**



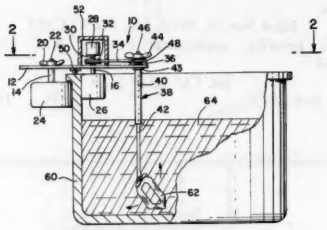
1. Apparatus for processing photographic material in sheet or roll form, comprising:

a tubular carrier constructed and arranged to hold the photographic material arcuately therein and to hold liquid in the lower portion of the carrier when the longitudinal axis of the carrier is disposed horizontally;

a base constructed and arranged to support the carrier rotatably on said longitudinal axis when horizontally disposed thereon; and

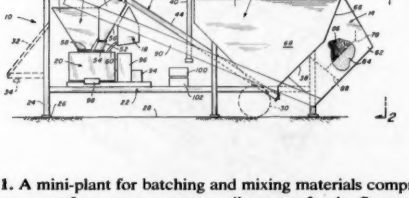
means on the carrier and on the base engagable with each other when the carrier is supported on the base to oscillate the carrier in the direction of said longitudinal axis when the carrier is rotated.

3,905,585
AGITATING DEVICE
Leslie B. Wallman, 18 Dogwood Cir., Matawan, N.J. 07747
Filed Oct. 4, 1974, Ser. No. 512,358
Int. Cl.[2] B01F 7/30
U.S. Cl. 259—111 6 Claims



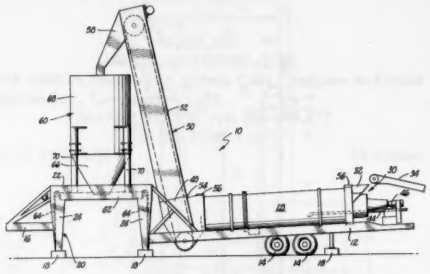
1. Agitating apparatus which comprises: an elongated generally horizontal member, a first axis and a second axis each being elongated and depending from said generally horizontal member, means for selectively securing said first axis to said generally horizontal member throughout a range of axially aligned positions, a first roller carried on said first axis for rotation thereabout and a second roller fixed to said second axis, a shaft depending from said generally horizontal elongated member for rotation about the axis thereof, said shaft having a generally planar disposed at the end thereof most remote from said generally horizontal member, and means for rotating said second roller and said shaft.

3,905,586
MINI-PLANT FOR BATCHING AND MIXING MATERIALS
Robert N. Wall, Jr., 2309 Dawn Dr., Georgetown, Tex. 78626
Filed Oct. 15, 1974, Ser. No. 514,502
Int. Cl.[2] B28C 5/08
U.S. Cl. 259—154 9 Claims



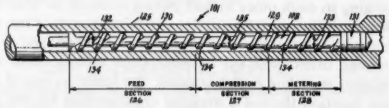
1. A mini-plant for batching and mixing materials comprising support frame means, storage silo means for dry fine particles secured to the support frame means, storage bin means for coarse dry materials secured to the silo means, dry materials weigh bin means secured to the support frame means, first conveying means extending between the silo means and the dry materials weigh bin means for transporting a preselected quantity of dry fine particles thereto by weight, second conveying means extending between the storage bin means and the dry materials weigh bin means for transporting the coarse materials thereto in a preselected quantity by weight, wet weigh bin means secured to the support frame means, and mixer means secured to the support frame means and in communication with the dry materials weigh bin means and the wet material weigh bin means for receiving the contents of the weigh bins therein for mixing thereof to produce the desired end product.

3,905,587
MOBILE ASPHALT PLANT
Marvin B. Freeman, Los Angeles, Calif., assignor to Stansteel Corporation, Los Angeles, Calif.
Filed Aug. 19, 1974, Ser. No. 498,593
Int. Cl.[2] B28C 1/22
U.S. Cl. 259—158 1 Claim



1. In a mobile asphalt plant, or the like, the combination of:
a. an elongated mobile chassis having a transverse vehicular passageway therethrough at one end;
a drum-type mixer, for mixing aggregates and liquid asphalt, mounted on and extending longitudinally of said chassis, said mixer having inlet means, for the materials to be mixed therein, adjacent the other end of said chassis, and having an outlet adjacent said passageway;
c. a holding bin carried by said chassis at said one end thereof and movable vertically between a lower position within said passageway and an upper position above said passageway;
d. means for raising and lowering said holding bin between its said upper and lower positions;
e. said holding bin including a lower, downwardly convergent, frusto-conical portion and a cylindrical upper portion in telescopic relationship, said upper portion being telescoped downwardly over said lower portion when said holding bin is in its said lower position, and said upper portion being extended upwardly relative to said lower portion when said holding bin is in its said upper position;
f. means for moving said upper portion of said holding bin upwardly and downwardly relative to said lower portion thereof; and
g. an elevator pivotally mounted on said chassis for movement between a generally horizontal retracted position and an upright extended position, and said elevator, when in its said extended position, connecting said mixer outlet to said holding bin.

3,905,588
METHOD AND APPARATUS FOR PLASTICATING POLYMERS
Lawrence Walter Reinhart, Loveland, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Feb. 8, 1974, Ser. No. 440,694
Int. Cl.[2] B29B 1/10
U.S. Cl. 259—191 5 Claims



1. An extruder screw having a core and a thread thereon defining a feed section, compression section, and metering section wherein the core diameter is larger in the metering section than in the feed section and increases as the screw progresses through the compression section from the feed to

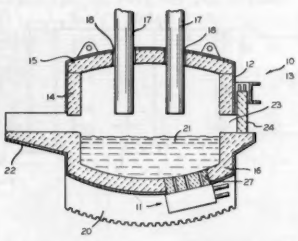
the metering section that further comprises a thread having a varying outside diamter with the least such outside diameter being in the compression section and with its greatest outside diameters being substantially equal and at the ends of the thread in the feed and compression sections, whereby the thread has an hourglass outside diameter profile.

3,905,589

STEEL PRODUCTION METHOD AND APPARATUS

Eberhard G. Schempp; Jai K. Pearce, and David L. Schroeder, all of Pittsburgh, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1972, Ser. No. 238,338
Int. Cl. C21c 7/00
U.S. Cl. 266—35 **5 Claims**



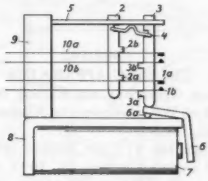
1. Apparatus for treating ferrous metal including,
a refractory lined vessel for receiving a quantity of said metal, said vessel having side walls, a removable cover having apertures formed therein and a shallow bottom constructed and arranged to receive molten metal, a plurality of tuyere means extending through said refractory lining and including a first tuyere pipe and a second tuyere pipe spaced from and surrounding said first tuyere pipe, each of said tuyere pipes having a discharge end adjacent the bottom of said vessel and opening into said vessel beneath the level of metal disposed therein for injecting process gases beneath said molten metal,
a plurality of fluid sources,
the outer ends of said tuyere pipes being disposed on the exterior of said vessel and means on the exterior portions of each of said tuyere pipes for connection to individual ones of said fluid sources,
means for selectively connecting predetermined ones of said fluid sources to said first and second tuyere pipes,
a plurality of electrodes extending into said vessel, and means for energizing said electrode means for heating said molten metal by the creation of an electrical discharge therefrom,
means for positioning said electrodes in said apertures and for moving said electrodes in a generally vertical direction toward and away from said hearth to position said electrodes adjacent the molten metal contained in said vessel,
means for rocking said vessel about a substantially horizontal axis,
a molten metal discharge opening formed in said refractory lining and on one side of a plane containing the pivotal axis of said vessel for discharging molten metal from said vessel when the latter is pivoted about said axis,
a slag discharge opening formed in said refractory lining and disposed on the other side of said plane so that molten metal may be poured from said vessel when it is pivoted toward said one side and slag removed when it is pivoted toward said other side,
the open inner ends of each of said tuyere pipes being disposed on said other side of said plane whereby the discharge ends of all of said tuyere pipes remain below the level of molten metal when said vessel is tilted toward said other side for slag removal and when said vessel is in an untilted position, and said discharge ends of all of said tuyere pipes being above the level of molten metal when said vessel is tilted toward said one side to discharge molten metal from said molten metal discharge opening.

3,905,590

ARRANGEMENT IN CONTACT-SPRING-SETS

Karl Gunnar Brunberg, Huddinge, Sweden, assignor to Telefonaktiebolaget I M Ericsson, Stockholm, Sweden

Filed Apr. 3, 1974, Ser. No. 457,489
Claims priority, application Sweden, Apr. 12, 1973, 73051799
Int. Cl.² F16F 1/22
U.S. Cl. 267—160 **7 Claims**



1. A make-and-break contact spring assembly comprising:
a pair of spring contacts mounted in parallel relationship, said spring contacts being flexible either into the break position or the make position and biased to occupy a predetermined one of said switching positions;
a pair of bars, each mounted for lengthwise displacement in either direction and coupled to one of said spring contacts for flexing the same from said selected position into the other position upon displacement of said bars relative to each other;
a two-arm lever, each arm of said lever being coupled to one of said bars for displacing the bars relative to each other in response to a pivotal movement of the lever, said lever being pivotally mounted between the two bars whereby upon pivoting of the lever the two bars are displaced in opposite direction, said displacement moving the spring contacts from said one position into said other position; and
drive means operatively coacting with one of said bars for displacing the same, said displacement of said one bar causing pivoting of the lever and said pivoting causing displacement of the other bar into a position in which both the spring contacts are flexed by said bars from said one switching position into the other switching position and are retained in said other position.

3,905,591

PATIENT'S COUCH

Hermann Schorr, Vachendorf; Willi Schaefer, Burk; Johann Finkenzeller, Tennenlohe, and Fritz Wittkopp, Weiher, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 75,116, Sept. 24, 1970, abandoned. This application Oct. 10, 1973, Ser. No. 405,058
Int. Cl.² A61G 13/00
U.S. Cl. 269—328 **5 Claims**

1. In a patient's couch swingable about its longitudinal axis and having a table top, a foot step adjustable in the longitudinal direction of said table top and side supports for fixing the patient, a carriage for said side supports, sliding clamps, said carriage being located under said table top and being guided by said sliding clamps for movement along longitudinal edges of said table top, said carriage having guides for said supports, said guides being mounted in the carriage in a plane inclined to the table top and having means for fixing said side supports

at selectable positions relative to said guides, said side supports having the shape of narrow gripping jaws extending

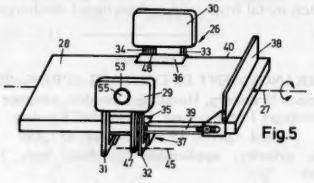
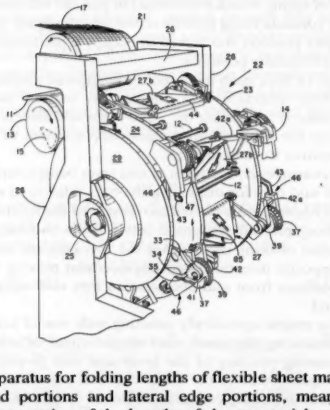


Fig.5

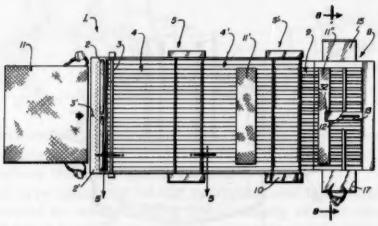
above said table top to substantially the height of a lying patient.

3,905,592
FOLDING APPARATUS
Harvey J. Spencer, Green Bay, and Eugene W. Wittkopf, Little Suamico, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Division of Ser. No. 177,301, Sept. 2, 1971, Pat. No. 3,782,714. This application Nov. 15, 1973, Ser. No. 416,050
Int. Cl.[2] B65H *45/00*
U.S. Cl. 270—61 R **1 Claim**



1. In apparatus for folding lengths of flexible sheet material having end portions and lateral edge portions, means for feeding a succession of the lengths of sheet material endwise in open substantially planar condition in spaced relation along a path, a frame, a rotatable carrier on the frame having an axis of rotation and comprised of a pair of plates spaced apart along the said axis of rotation, a plurality of folding boards in circumferentially spaced apart relation supported between the plates of the carrier and each comprising a pair of panels forming a surface for the receipt of a length of sheet material to be folded, the panels of a folding board being spaced apart longitudinally of the board to define a gap in the folding board for providing a transverse fold in sheet material on said folding board, support means including rotatable shaft means supporting each of the panels of each folding board for rotation between a position in which the panels are in end-to-end substantially planar relation to a position in which the panels are in back-to-back substantially parallel relation, means for rotating said shaft means, tucking means for infolding the edge portions of sheet material at the gap between said panels, finger means to assist folding of the sheet material and means for actuating the finger means in timed sequence with the rotation of the panels to the back-to-back position to provide for entry of the finger means between the panels to urge said sheet material to the folded condition, said frame having guide means projecting therefrom and the guide means being connected with said finger means for guiding movement of the finger means, and means supporting said finger means for movement in an orbital path so that the finger means move inwardly and outwardly between the panels in the rotated back-to-back condition of the panels.

3,905,593
FLATWORK FOLDING SYSTEM
Sheldon P. Behn, Highland Park, Ill., assignor to Super Laundry Machinery Company, Inc., Chicago, Ill.
Filed May 7, 1973, Ser. No. 357,959
Int. Cl.[2] B65H *45/12*
U.S. Cl. 270—62 **10 Claims**



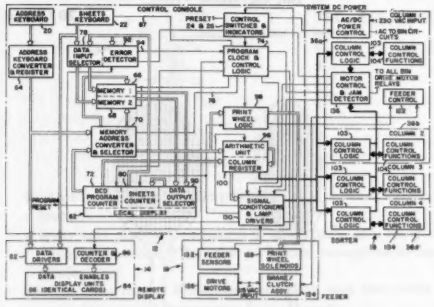
1. A flatwork folding system to accommodate flatwork of a variety of widths and/or lengths comprising in combination: lateral folding apparatus comprising conveyor means for moving the flatwork to an outlet station thereof; at least a first pair of lateral folding means longitudinally spaced along said conveyor means for sequentially producing folds in a flatwork piece extending in a given lateral direction, timer means associated with said pair of lateral folding means which timer means includes control means for initiating operation of the operable associated lateral folding means when a given intermediate point of the flatwork piece involved reaches the associated lateral folding means, said conveyor means to receive flatwork pieces of varying dimension in said lateral direction; and cross-folding apparatus having an inlet station positioned to receive the laterally folded flatwork pieces from the outlet station of said lateral folding means, conveyor means for conveying flatwork pieces therein, at least one pair of crossfolding means spaced along the associated conveyor means for sequentially producing in the flatwork pieces a first and a second cross-fold at right angles to the lateral folds produced by said lateral folding means, said conveyor means of said crossfolding apparatus including a first conveyor assembly moving generally horizontally over a downwardly facing inlet slot extending longitudinally of the direction of movement of the first conveyor assembly, the first of the cross-folding means being mounted above said inlet slot and when operative depressing the portion of the flatwork piece therebelow downwardly through said inlet slot, flatwork piece sensing means responsive to a flatwork piece on said first conveyor assembly for operating said first cross-folding means, said conveyor means of said cross-folding apparatus including a second conveyor assembly extending generally horizontally from an inlet station to a first outlet station, each first cross-folded flatwork piece dropping upon the inlet end of said second conveyor assembly and moving the flatwork piece to the latter outlet station if only one cross-folding operation is to be carried out, a flatwork piece leading edge sensing means spaced a given distance beyond the second of said cross-folding means for initiating operation of the same to produce a second cross-fold in the flatwork piece a given distance from the leading edge thereof which is no less than about one half the lateral dimension of the flatwork piece having the longest dimension in said lateral direction, said conveyor means of said cross-folding apparatus including a

third conveyor assembly for moving a flatwork piece from an inlet end to a second outlet station, means in confronting relation to the inlet end of said third conveyor assembly for defining an inlet mouth into which the second of said cross-folding means when operative pushes said portion of said flatwork piece into the latter inlet mouth to form a second cross-fold in the flatwork piece, said third conveyor assembly then delivering the second cross-folded piece to said second outlet station in the absence of any subsequent crossfolding operations.

3,905,594
MEMORY AND VISUAL INDICATOR SYSTEM FOR SORTING DEVICE

Ernest D. Davis, Richmond Beach, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed Apr. 16, 1973, Ser. No. 351,447
Int. Cl.[2] B65H *29/60*
U.S. Cl. 271—173 **7 Claims**

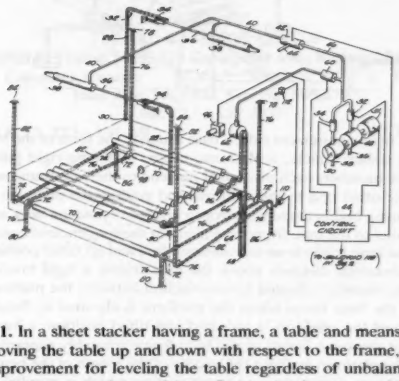


5. A randomly programmed sequential sorting machine for sequentially filling a plurality of sheet receiving trays with a number of sheets programmed for selected trays comprising sheet sorting means including a plurality of addressable sheet receiving trays, sheet conveying means for conveying sheets, and movable deflection means for deflecting sheets from said sheet conveying means into an addressed sheet receiving tray, sheet feeding means for feeding sheets from a supply to said sheet conveying means, programming means adapted to store sheet receiving trays address information and sheet count information indicative of the number of sheets to be directed to each tray, and inputing means to randomly input said tray address and sheet count information for storage in said programming means during an input mode of operation thereof, said programming means operating during an output mode of operation to sequentially position said movable deflection means in accordance with stored address information to deflect sheets from said sheet conveying means into addressed sheet receiving trays beginning with the lowest address tray and progressing sequentially to higher address trays while causing said sheet feeding means to supply the number of sheets to each address tray in accordance with the stored sheet count information for the corresponding address, said programming means including memory means adapted to receive and store the tray address and sheet count information from said inputing means, said memory means being operable during an output mode of operation to output said stored sheet count information upon receipt by said memory means of a corresponding tray address therefor, and program counter means operative to present in sequence to said memory means the address of each tray in said sheet sorting means to cause outputing from said memory means of sheet count information stored for each tray address, and programmed clock and control logic means to provide input pulses to said program counter means, said program counter means operating in response to said input pulses to provide sequential tray addresses to said memory means, sheet count means connected to register a sheet count output from said memory means, and sheet count zero detection means connected to said sheet count means to sense a sheet count registered thereby, said sheet count zero means operating upon sensing a sheet count to terminate the input pulses from said programmed clock and control logic means to said program counter means.

3,905,595
SHEET STACKER

John Q. Adams, Cedarburg, and David Adams, West Bend, both of Wis., assignors to I.D. Inc., Cedarburg, Wis.

Filed Aug. 15, 1973, Ser. No. 388,523
Int. Cl. B65h *31/10*
U.S. Cl. 271—217 **7 Claims**

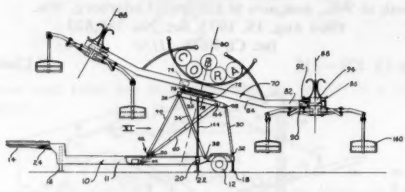


1. In a sheet stacker having a frame, a table and means for moving the table up and down with respect to the frame, the improvement for leveling the table regardless of unbalanced loads thereon and comprising a first torsion bar at one side of the table, a second torsion bar at the opposite side of the table, pairs of sprockets fixed at both ends of both torsion bars, pairs of leveling chains at both ends of said torsion bars, anchor means anchoring each such chain to the frame above the table, said chain extending downwardly from its said anchor means and around the bottom of a sprocket on an end of a torsion bar and thence laterally across the table and around the top of a sprocket on an end of a torsion bar at the other side of the table and thence downwardly and means anchoring the chain to the frame below the table whereby unbalanced forces tending to tilt the table will be transmitted by said torsion bars from one side of the table to the other to tend to balance said forces and maintain the table level, corresponding chains of each pair of chains being anchored to the frame above the table and above the ends of said first torsion bar at said one side of the table and other corresponding chains of each pair of chains being anchored to the frame above the table and above the ends of said second torsion bar at said opposite side of said table, the chains of each pair having side-by-side runs extending across the table.

4. In a sheet stacker having a frame and having a lift table movably mounted on the frame for upward and downward movement, and having means for raising and lowering the lift table, the improvement wherein said means for raising said lift table includes at least one hydraulic cylinder coupled to said lift table and pump means for forcing hydraulic fluid into said cylinder to raise said lift table, said pump means including a relatively high capacity pump for raising said lift table at a relatively high speed and a relatively low capacity pump for raising said lift table at a relatively low speed, a plurality of rollers journaled to said lift table and forming the upper surface thereof, a plurality of sprockets coupled to alternate rollers, a drive chain operatively engaged with said sprockets for driving the rollers coupled thereto, a hydraulic motor operatively engaged with said drive chain for driving the same, and hydraulic valve means selectively coupling said low capacity pump to said hydraulic motor to drive the motor at a relatively low speed and selectively coupling said high capac-

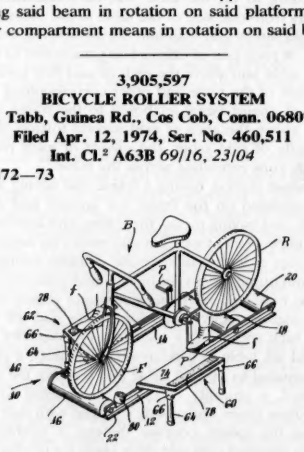
ity pump to said hydraulic motor to drive the motor at a relatively high speed.

3,905,596
TRAILER MOUNTED COLLAPSIBLE ROUNDABOUT
Gerald L. Barber, 309 Cardinal Dr., Taylors, S.C. 29687
Filed June 21, 1974, Ser. No. 481,559
Int. Cl.[2] A63G 1/10, 1/28
U.S. Cl. 272—29 **10 Claims**



1. In an amusement ride; a base frame in the form of the bed of a trailer vehicle, a platform, means including rigid guide frame members each pivoted at one end to the base frame and at the other end to the platform and guiding the platform in swinging bodily movement from a collapsed position near and parallel to the base frame and in about the longitudinal center of the base frame to an elevated and fore and aft tilted position a substantial distance above the base frame, a rigid bracing frame member adapted for connection between the platform and the base frame when the platform is elevated to fixedly support the platform in elevated and tilted position, a beam about the same length as the base frame rotatably supported on the platform at about the middle of the length of the beam, said beam comprising a central portion which is parallel to said base frame in collapsed position of said platform and tilted relative to the base frame in elevated position of said platform, said beam having end portions which incline upwardly from the plane of said central portion of the beam, each said end portion of the beam being substantially horizontal when the respective end of the beam is in its lowermost rotated position, a rotatable member rotatably supported on each end of said beam, a plurality of support arms extending generally radially from each said rotatable member, passenger compartment means comprising a compartment swingably supported from the outer end of each support arm, and means for driving said beam in rotation on said platform and said passenger compartment means in rotation on said beam.

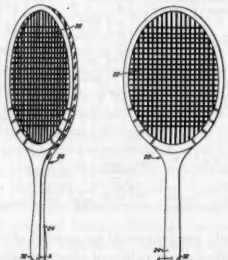
3,905,597
BICYCLE ROLLER SYSTEM
Lester M. Tabb, Guinea Rd., Cos Cob, Conn. 06807
Filed Apr. 12, 1974, Ser. No. 460,511
Int. Cl.[2] A63B 69/16, 23/04
U.S. Cl. 272—73 **17 Claims**



13. A bicycle roller system including a frame, rollers carried by said frame and arranged to support the wheels of a free-standing bicycle to permit the bicycle to be operated in a self-balanced, self-propelled manner thereon, the bicycle roller system being characterized by:

side platforms mounted on each side of the frame and presenting upper surfaces which would be adjacent the bicycle pedalling region of a bicycle when mounted on the rollers of the bicycle roller system, the side platforms being mounted in an inclined position with the upper surfaces thereof slanting downwardly toward the center of the frame, whereby the side platforms may be reached by the feet of a bicycle operator astride a bicycle, when the bicycle is mounted on the roller system in an upright operating position, thereby aiding the operator in obtaining and maintaining balanced bicycle operation without another's assistance.

3,905,598
TENNIS RACKET HAND GRIP
George M. Ballog, 266-3B Iven Ave., St. Davids, Pa. 19087
Filed Mar. 13, 1974, Ser. No. 450,607
Int. Cl.[2] A63B 49/08
U.S. Cl. 273—75 **20 Claims**



15. In a tennis racket having a head frame and a shaft, said racket having a longitudinal axis, a hand grip for providing, on the shaft of the tennis racket, a prescribed gripping posture for the hand when the racket is gripped by the hand in either of two selectable positions, said hand grip comprising:

a gripping surface extending longitudinally along the hand grip, said gripping surface having a forward edge on one side of the hand grip and a rearward edge on an opposite side of the hand grip;

first contoured means on said gripping surface extending generally laterally between said forward edge and said rearward edge for positively locating the thumb and forefinger of the hand in a given relative alignment at a first location on the gripping surface with the hand in said prescribed gripping posture when the racket is in one of said two positions; and

second contoured means on said gripping surface extending generally laterally between said forward edge and said rearward edge for positively locating the thumb and forefinger in essentially the same given relative alignment at a second location on the gripping surface with the hand in essentially the same gripping posture when the racket is in the other of said two positions;

said second location being spaced at a predetermined angularity from said first location in a lateral and longitudinal direction such that the hand grip is rotated and displaced laterally and longitudinally relative to the hand when the placement of the racket is changed from one to the other

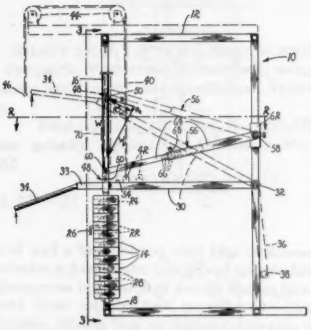
of said two positions over an angular measure established by said predetermined angularity.

3,905,599

VARIABLE RESISTANCE EXERCISING DEVICE

Martin S. Mazman, 945 S. Clovis Ave., Fresno, Calif. 93727

Filed June 29, 1973, Ser. No. 375,107
Int. Cl. A63b *21/06, 21/20*
U.S. Cl. 272—81 **12 Claims**



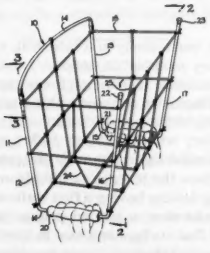
1. An exercise device comprising:
a frame;
a lever arm pivotally mounted in said frame at a lever arm pivot and pivotally movable by a user through an exercise cycle;
user contact means interconnected with said lever arm for applying pivotal movement force thereto;
resistance means interconnected with said frame; and
an interconnection mechanism interconnecting said resistance means to said lever arm at a lever arm connecting point disposed in spaced relationship with said lever arm pivot, said interconnection mechanism having movement means movable in response to pivotal movement of said lever arm to vary the spaced relationship between said lever arm connecting point and said lever arm pivot, and guide means interconnected with said frame and disposed to direct the path of movement of said movement means.

3,905,600

WIRE PROJECTILE RECEIVING FRAME

George M. Bourdamis, 8024 Woodman, Panorama City, Calif. 91402

Filed Apr. 17, 1974, Ser. No. 461,592
Int. Cl.² A63B *71/02*
U.S. Cl. 273—96 R **5 Claims**



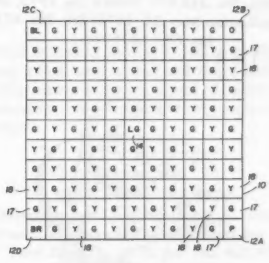
1. A game device for catching and throwing a ball comprising:
a rigid frame means defining a four-sided cavity;
a flexible netting carried on said frame means and configured therewith enclosing said cavity except for an entrance leading into the interior of said cavity;
said frame means includes a pair of U-shaped sub-assemblies joined at the upper terminating ends by an arcuate member maintaining said sub-assemblies in fixed spaced apart parallel relationship;
handles secured to said frame means for grasping by the hands of a player engaged in the conduct of a game
said handles secured to the central portion of each of said U-shaped sub-assemblies; and
including releasable attachment means interconnecting said terminating ends and said arcuate member.

3,905,601

BOARD GAME APPARATUS

David L. Tindall, No. 8-578 Coronation Ave., Kelowra, British Columbia, Canada

Filed Aug. 26, 1974, Ser. No. 500,279
Int. Cl.² A63F *3/00*
U.S. Cl. 273—131 AB **3 Claims**



1. A game board of square configuration divided into an odd number of marked squares, with each of the four corner squares and the central square individually marked and with the remaining squares marked in alternate fashion such that each such square is surrounded by adjacent squares of another marking than itself, with non-adjacent such squares, that meet at their corners, being of similar marking, together with one playing piece identified by marking with the central square marking, and four sets of pieces, each set being identified by marking with one of the four corner square markings.

3,905,602

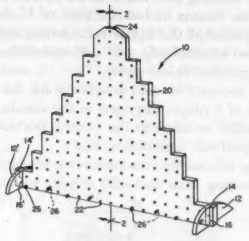
BOARD GAME APPARATUS

John M. Madonna, Jr., 186 Beaconsfield Rd., Worcester, Mass. 01602, and Eugene W. Sargent, Wataquodoc Hill, Bolton, Mass. 01740

Filed June 24, 1974, Ser. No. 482,022
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AE **15 Claims**

11. In combination with a plurality of markers and a chance determining means regulating the disposition of said markers with respect to a game board, the invention comprising a game board
A. of thin planar configuration and adapted for vertical erection during play,
B. having means defining a plurality of horizontally and vertically spaced stations grouped in horizontal rows on opposed faces thereof for the reception of markers thereat, the number of said stations in said rows decreasing in the vertical direction,
C. formed to render visible on one face of said board mark-

ers disposed on the opposed face thereof whereby players stationing markers on opposed faces may observe the

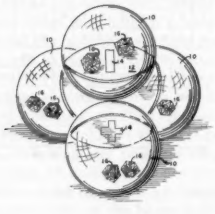


opposing player's markers during the course of a game played thereon.

3,905,603
DICE GAME

John H. Hoetzel, 650 Americana Dr., Apt. 108, Annapolis, Md. 21403

Division of Ser. No. 344,877, March 26, 1973, abandoned. This application May 24, 1974, Ser. No. 473,214
Int. Cl.[2] A63F *9/04*
U.S. Cl. 273—138 R **6 Claims**



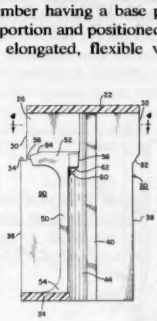
1. A game comprising:
a. four substantially identical, symmetrical geometric containers,
b. each of said containers being divided into inner and outer portions by a platform extending across their inner walls,
c. at least one movable element in each of said containers,
d. said containers being connected together and arranged in the form of a tetrahedron wherein any combination of three of said containers always have a portion thereof lying in a common plane, and a fourth of said containers is upright with its respective platform being substantially parallel to said plane,
e. said containers each having at least the outer portion thereof essentially transparent whereby when said containers are thrown or dropped, said fourth container appears upright and at least one movable element is visible in said fourth container as it rests on said container platform.

3,905,604
SPINDLE ADAPTOR FOR AUTOMATIC RECORD CHANGERS

James T. Dennis, 3900 SE. 29th St., Oklahoma City, Okla. 73115

Filed Oct. 29, 1973, Ser. No. 410,690
Int. Cl.[2] G11B *17/12, 17/14*
U.S. Cl. 274—10 S **9 Claims**

1. In a phonograph, the combination of, a record ejecting spindle including a vertically extending body portion and having a movable record ejector member for ejecting the bottom record of a stack of small hole records positioned on said record ejecting spindle to travel into playing position on the turntable, a spindle adaptor adapted to be placed in an operative position on said record ejecting spindle, said adaptor having a shelf for supporting a stack of large hole records above the turntable and including a body portion having opposed wall portions which define a vertically extending recess therebetween, a member having a base portion solidly connected to said body portion and positioned in said recess, said member having an elongated, flexible vertically extending

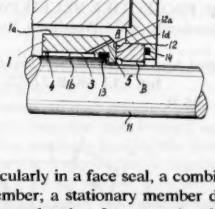


portion intermediate said base portion and a free head portion, said head portion having one edge which is adapted to be engaged by said record ejector member and an opposite edge which is positioned adjacent said adaptor shelf when said adaptor is in operative position on said spindle, whereby said free head portion is moved in an arcuate path within said recess by engagement of said record ejector member with said one edge and said opposite edge of said free head portion moves the bottom record of a large hole stack of records off said adaptor shelf during a record changing cycle.

3,905,605
FACE SEAL

Werner Hübner, Beindersheim, Germany, assignor to Sulzer-Ksb Kernkraftwerkspumpen GmbH, Frankenthal, Germany

Filed June 1, 1973, Ser. No. 366,026
Claims priority, application Germany, June 9, 1972, 2228081
Int. Cl.[2] F16J *15/00*
U.S. Cl. 277—22 **12 Claims**



1. In a seal, particularly in a face seal, a combination comprising a rotary member; a stationary member defining with said rotary member a chamber for a supply of fluid whose temperature fluctuates at times within a wide range; a primary annular sealing device provided in said stationary member; and a secondary annular sealing device provided on said rotary member and cooperating with said primary sealing device to at least reduce the leakage of fluid from said chamber, one of said sealing devices having a first surface in contact with the fluid in said chamber, a second surface located substantially opposite said first surface and also in contact with the fluid in said chamber, and channel means provided in said one sealing device between said surfaces thereof to permit the fluid to circulate within said chamber and to exchange heat with said one sealing device along said surfaces so that the temperature

of said one sealing device in the region of said first surface equals or approximates the temperature of said one sealing device in the region of said second surface irrespective of fluctuations of the temperature of fluid in said chamber, said second surface of said one sealing device defining with the periphery of said rotary member an annular compartment which constitutes a first portion of said chamber, said chamber further having a second portion in communication with said compartment at a plurality of locations including communication by way of said channel means, said one sealing device further having internal centering projections abutting against the periphery of said rotary member.

3,905,606

SHAFT SEAL LIFT-OFF ARRANGEMENT

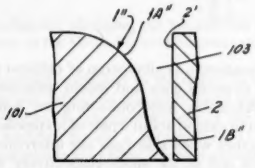
Dusan Florjancic, Winterthur, Switzerland, assignor to Klein, Schanzlin and Becker Aktiengesellschaft, Frankenthal, Germany

Filed Apr. 20, 1973, Ser. No. 353,135

Claims priority, application Germany, May 15, 1972, 2222082

Int. Cl.[2] F16J *15/34, 15/16*

U.S. Cl. 277—27 **8 Claims**



1. In a fluid seal arrangement, the combination of a shaft member; a housing member spacedly surrounding said shaft member and defining therewith a fluid-containing pressure chamber and a low-pressure area adjacent to the periphery of said shaft member, one of said members being rotatable about the axis of said shaft member; and first and second sealing rings located in said pressure chamber and respectively secured to said shaft member and said housing member, one of said rings being movable axially of said shaft member and said rings having neighboring first surfaces defining an annular gap for the leakage of fluid from said chamber into said area, said one ring further having a second surface facing away from the respective first surface and exposed to fluid pressure in said chamber, the width of said gap decreasing in a direction from said pressure chamber toward said low-pressure area and the radially outwardly located portion of said first surface of one of said sealing rings having a convex outline with radii of curvature which diminish in a direction from said low-pressure area toward said pressure chamber and the radially inwardly located portion of said first surface of said one of said sealing rings having a concave outline, said radially outwardly located convex portion and said radially inwardly located concave portion of said first surface smoothly merging into each other.

3,905,607

FACE-TYPE SEALING RING WITH INNER SEAL BAND

Roy L. Maguire, Edelstein; Bernard F. Kupfert, Peoria, and Gerald E. Whitehurst, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 8, 1974, Ser. No. 440,648

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—92 **12 Claims**

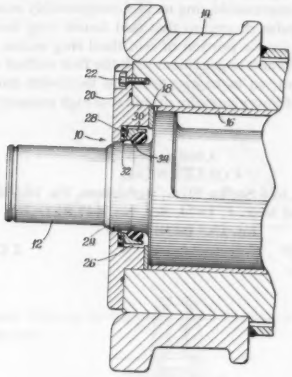
1. An axially and radially compact seal assembly for relatively rotatable members, comprising:

a pair of small section metal seal rings having means defining axially disposed seal faces disposed at the innermost minimum diameter of each of said rings engaged in sealing contact;

one of said seal faces having means defining a narrow seal band at the innermost minimum diameter thereof;

first mounting means securing one of said rings to one of said members;

second mounting means securing the other of said rings to the other of said members;



one of said mounting means including loading means for applying a face load to said seal rings; and,

said loading means including a pair of opposed convergent conical ramps and a resilient O-ring compressed between the ramps.

3,905,608

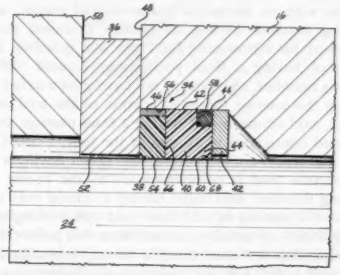
HIGH PRESSURE SEAL

John H. Olsen, Vashon, and Benjamin A. Thomas, Burton, both of Wash., assignors to Flow Research, Inc., Kent, Wash.

Filed Dec. 26, 1973, Ser. No. 427,439

Int. Cl. F16j *15/06*

U.S. Cl. 277—188 **8 Claims**



1. A high pressure seal assembly to seal an interface between two relatively moving members, such as in a high pressure piston and housing assembly, said first member having a first sliding seal surface to engage said seal assembly and movable relative to said seal assembly, said second member having a second stationary seal surface to engage said assembly and being stationary with respect to said seal assembly, said seal assembly having a forward high pressure side and a rear low pressure side, said seal assembly comprising:

a. a first rear substantially rigid backup ring means fixedly mounted to said second member,

b. a second relatively high yield strength seal ring means positioned between said first and second surfaces and forward of said backup ring means, said second ring means fitting closely against said first surface,

c. a third relatively low yield strength seal ring means positioned between said first and second surfaces and forward

of said second ring means, said third ring means having a first sliding seal surface in constant sealing engagement with said first surface of the first member, and a second stationary seal surface engaging said second surface of the second member,

d. said third ring means having an annular recess formed in said third ring means, and

e. a fourth compressible ring means compressibly mounted in said annular recess, so that said fourth ring means is pressing at least a portion of said third ring means laterally into constant engagement with the first surface of the first member, so as to create a seal therewith during a condition of lower pressure at said seal high pressure side.

3,905,609

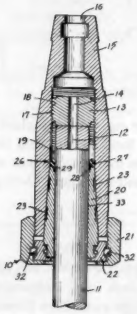
COLLET SEAL

Ernst Sussman, 634 Stefko Blvd., Bethlehem, Pa. 18106

Filed Mar. 4, 1974, Ser. No. 447,822

Int. Cl.[2] B23B *31/20*

U.S. Cl. 279—20 **2 Claims**



1. A collet chuck comprising a tool mounting member provided with an elongated frusto-conical recess, said tool mounting member having an interior threaded portion, a passageway for introducing fluid into said member, an elongated tool having a fluid passageway located within the mounting member, an adjusting nut having a threaded exterior engaging the interior threaded portion of the tool mounting member, said adjusting nut having a fluid passage and being positioned contiguous to an end of the tool, a collet located within said frusto-conical recess, said collet having a tapered outer surface that is complimentary to the recess of said mounting member, said collet having a central bore of a size to receive a portion of said tool, said collet being provided with a plurality of radially disposed slots that permit the collet to be expanded and contracted, a coolant seal affixed to one end of said collet, said seal being of a sufficient size to sealingly engage the frusto-conical recess of said mounting member and said elongated tool, said coolant seal including an enlarged rouned toroidal portion and a flange of reduced size on one side of said toroidal portion, said flange being received snuggly in a circumferential recess that is provided in said end of the collet, an end of the flange abutting a shoulder on the collet and the flange having a generally circular formation, means on said mounting member for causing said collet to expand and contract to clampingly engage said tool whereby the fluid passes through the passageway of said mounting member and said tool but is prevented from passing around said tool by said collet and seal, said seal being made of a compressable material having memory characteristics, an adhesive for securing the seal to the end of the collet, said means for expanding and contrasting said collet comprising a retainer arranged in threaded engagement with said tool mounting member, an inner element arranged within said retainer, and a bearing interposed between said inner element and said retainer.

3,905,610

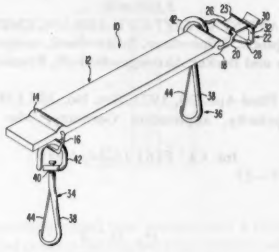
COMBINATION SKI BINDING STRAP AND SKI BOOT FASTENER

John R. Dini, 1714 El Camino Real, Redwood City, Calif. 94063

Filed Mar. 5, 1974, Ser. No. 448,302

Int. Cl.[2] A63C *11/02*

U.S. Cl. 280—11.37 A **4 Claims**



1. In combination: a flexible strap of resilient material having a pair of opposed ends and means adjacent to the ends thereof for releasably interconnecting the same, the strap being adapted to extend about a pair of juxtaposed skis to hold the same together when said ends are interconnected; a fastener for each end of the strap, respectively, each fastener having means for receiving the buckle of a ski boot and for releasably holding the buckle against removal therefrom; said interconnecting means including means connected to said strap and coupled with each fastener, respectively, for attaching the same to a respective end of the strap.

3,905,611

SUPPORT MECHANISM FOR SAFETY SKI BINDINGS

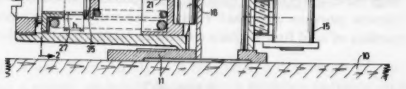
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed Dec. 27, 1972, Ser. No. 318,872

Claims priority, application Germany, Dec. 29, 1971, 2165314

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **44 Claims**



1. A support mechanism for safety ski bindings comprising:

retaining spring means for applying ski boot retaining forces, said retaining spring means including two separate springs which cooperate to apply said retaining forces,

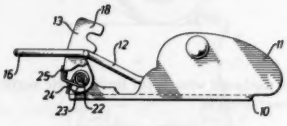
and spring adjusting means for adjusting the spring tension of said retaining spring means, said spring adjusting means including means for varying the tension of one of said springs without varying the tension of the other of said springs,

wherein said springs are arranged essentially concentrically with respect to one another.

3,905,612
SKI BINDING

Alvar Eskil Petrus Kjellstrom, Sollentuna, Sweden, assignor to AB Broderna Kjellstrom, Sollentuna, Sweden

Filed Feb. 13, 1974, Ser. No. 442,129
Claims priority, application Sweden, Apr. 13, 1973, 7305292
Int. Cl.[2] A63C 9/20
U.S. Cl. 280—11.35 B **6 Claims**



1. A ski binding for clamping the toe portion of the sole of a ski boot firmly to the ski and permitting easy release thereof, comprising

a. a plate member anchored to the upper face of the ski;

b. side members extending upwardly from said plate member and profiled to engage the sides of the boot sole;

c. a hook member having a substantially U-shaped cross section, pivoted to said plate member centrally relative to said side members and at a predetermined spaced distance forwardly therefrom;

d. the legs of said hook member being provided with notches facing said toe portion;

e. a substantially U-shaped resilient clamping member the legs of which being pivoted to said side members and bent inwardly to overlie a protruding portion of the sides and toe of the boot sole;

f. said legs being crimped together to form a central waist portion aligned with said hook member and dimensioned to extend from the toe of the sole to said hook member and being bent outwardly in opposite directions from said waist portion to form laterally extending leg members for engaging the notches of the respective facing legs of the hook member, and a bight portion so dimensioned as to permit the pivotal movement of said hook member therewithin.

3,905,613
SKI BINDING

David J. Romeo, Golden, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

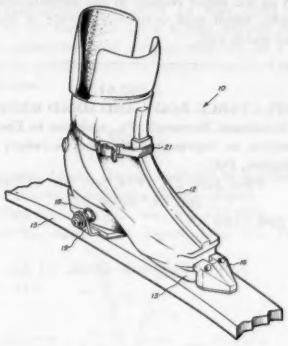
Filed Mar. 14, 1974, Ser. No. 451,323
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—11.35 R **19 Claims**

1. In combination, a ski boot, and step-in binding means for securing toe and heel portions of said boot to a ski, said step-in binding means comprising:

toe piece means adapted to be secured to a ski for engaging said toe portion of said ski boot;

yoke means adapted to be secured to a ski at a position beneath the heel portion of said ski boot and including a resiliently deformable trunnion portion having two upwardly extending arms, and two members defining facing seats which are supported by said arms; and

boot-carried retention means extending outwardly of said heel portion of said boot and adapted to engage said facing seats by causing the resilient deformation of said trunnion portion and to thereby permit step-in entry of

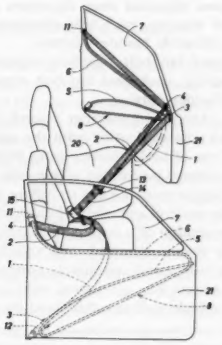


said binding means and releasibly securing said ski boot therein.

3,905,614
SAFETY BELT FOR VEHICLES

Oskar Lennart Lindblad, Box 11, 440 20 Vargarda, Sweden

Filed Dec. 29, 1972, Ser. No. 319,632
Int. Cl.[2] B60R 21/10
U.S. Cl. 280—150 SB **8 Claims**



1. A safety belt arrangement for a seat-occupant in a vehicle and of so called three point type, comprising in combination first and second belt parts diverging in a direction from an attachment inside the seat towards the wall side of the vehicle, at which the outer end of said first belt part in active condition of said safety belt contacts the side wall at an upper point on door panel, and the outer end of said second belt part contacts said door panel at a lower point on said wall, wherein said first belt part constitutes a shoulder belt and said second belt part constitutes a lap part, means for moving said upper and lower contact points in the longitudinally direction of the vehicle between a front position, in which said belt parts are positioned at a distance from said person and in front of him and a rear position, in which the safety belt is in said active condition, and further comprising a pair of runners, a guide rail for guiding said runners constituting one of said first and second contact points for said first and second belt parts, a flexible conveyor device having said runners connected thereto at distance from each other, said conveyor being guided by and movable along said guide rail, said guide rail having portions converging from the rear to the front of said wall and an

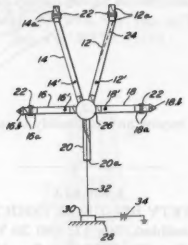
intermediate portion and said runners being placed at a distance from each other along said guide rail and said conveyor device, whereby one of said runners is conveyed in the same direction as the other runner in the longitudinal direction of the vehicle, when said conveyor device is being displaced along said guide rail.

3,905,615

INFLATABLE BODY AND HEAD RESTRAINT

Marvin Schulman, Broomall, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1974, Ser. No. 483,603
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—150 AB **11 Claims**



1. A vehicle occupant restraint system comprising:
a central housing;
first and second shoulder strap members extending from said central housing, each said shoulder strap member having an inflatable bladder portion;
first and second lap belt members extending from said central housing, each said lap belt member having an inflatable bladder portion;
an inflatable chin guard member operatively attached to and in fluid communication with the inflatable bladder portion of one of said shoulder strap members;
gas generator means positioned within said central housing for producing pressurized gas to inflate each said inflatable bladder portion and said inflatable chin guard member upon reception of a command signal; and
impact sensor means attached to a vehicle in which said occupant is riding and operatively connected to said gas generator means for generating said command signal when said vehicle suffers a threshold impact.

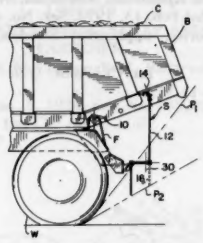
3,905,616

SPLASH GUARD ARRANGEMENT

James C. Tamburino, Roselle, and George Zaborsky, Westchester, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed July 12, 1974, Ser. No. 488,132
Int. Cl.[2] B62D *25/16*
U.S. Cl. 280—154.5 R **8 Claims**

1. A splash guard means for the rear wheels of a dump truck with a tiltable dump body pivoted near the rear end of the frame of the truck, said splash guard means comprising, in combination:
a flexible splash guard means having an upper section and a lower section, said upper section pivotally connected to said dump body rearward of said rear wheels for limiting the pattern of discharge from said rear wheels;
a frame connecting means for restricting the rotational movement of said flexible splash guard means;
a lower splash guard means operatively connected by said frame connecting means to said frame rearward of said rear wheels for limiting the pattern of discharge from said rear wheels;
a connecting means pivotally attached to said lower section of said flexible splash guard means and said frame rearward of said rear wheels for limiting the vertical travel of said lower section.

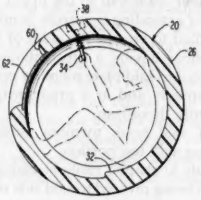


3,905,617

SELF-PROPELLED RECREATIONAL TOY VEHICLE

Harry Tabb Smith, P.O. Box 437, Yorktown Rd., Tabb, Va. 23602

Filed Aug. 27, 1974, Ser. No. 500,865
Int. Cl.[2] B62K *1/00*
U.S. Cl. 280—206 **15 Claims**



1. A self-propelled recreational vehicle comprising a generally annular main body member having a rolling surface about its outer periphery and defining a generally circular, axially extending interior cavity, said cavity including a portion constituting a seat along a major arc thereof for supporting an occupant along said arc facing in a position transverse the body member axis, hand grip means protruding from the surface of the cavity for enabling said occupant to shift his weight by appropriate manipulation so as to cause said body member to roll along said outer peripheral rolling surface whereby said occupant tumbles head-over-heels while riding within said cavity, brake means on said body member having a braking member movable from a retracted position flush with the outer peripheral surface of said body member to a radially, outwardly extended position, and means for actuating said brake means.

3,905,618

FOLDABLE RIDING VEHICLE

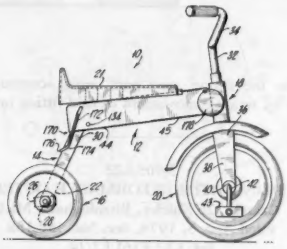
Andrea Miranda, Via Meloria, 8, Milan, Italy

Filed May 10, 1973, Ser. No. 359,038
Claims priority, application Italy, May 19, 1972, 24586/72
Int. Cl. B62k *15/00*
U.S. Cl. 280—278 **9 Claims**

1. A foldable riding vehicle which comprises:
a. a frame member including side walls having diagonal slots formed in the rear portions thereof;
b. a rear support member pivotally secured to the frame member towards its rear end forming a rear fixed pivot point and received within said frame member and having an upper portion positioned therein;

c. a front support member pivotally secured to the frame member at its forward end forming a forward fixed pivot point;
d. means secured to the rear and forward support members to allow movement of the vehicle;
e. a rigid link pivotally secured at one end to the rear support member adjacent the rear fixed pivot point, and at the other end to the forward support member adjacent the forward fixed pivot point;

allowing the application of a force to either the front or rear support members, causing movement of the member to which the force is so applied around its fixed pivot point, and allowing translation of the same force via the linkage and moving



pivot point to the other support member to allow simultaneous movement of the other support member around its fixed pivot point, until the support members fold against the frame member; and

f. safety means to insure retaining the rear and front support member in erect condition and including a narrow member having fingers extending inwardly of the slots and having downwardly extending portions joined by a lower connecting portion, the slot positioned on the wall to prevent rotational movement of the upper portion of the rear support strut when the fingers are in the lowermost position of the slot and to allow rotational movement of the rear support strut when the fingers are in the uppermost position in the slot.

3,905,619

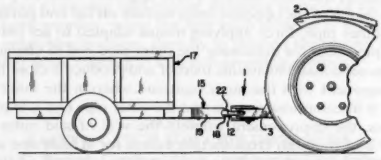
HITCH DEVICE

Merton E. Sylvester, Rt. No. 1, Sabetha, Kans. 66534

Filed Oct. 29, 1974, Ser. No. 517,389

Int. Cl.² B60D *1/14*

U.S. Cl. 280—415 A **12 Claims**



1. A hitch device for use between a prime mover and a towed vehicle and comprising:

a. a draft bar adapted to have opposite ends thereof rotatably mounted on respective hitch bars of a prime mover, said draft bar extending substantially transverse to the path of travel of the prime mover, said draft bar having a longitudinal axis and a leading side and a trailing side, said draft bar having a pin for each of the opposite ends thereof and each extending longitudinally from the respective opposite end of said draft bar, and pins being aligned on an axis substantially parallel with the longitudinal axis of said draft bar and spaced rearwardly of the trailing side of said draft bar;
b. a tongue member having one end thereof pivotally mounted on said draft bar intermediate the opposite ends of said draft bar; and
c. means positioned rearwardly of said draft bar and adapted to be mounted on a towed mobile frame for rotatably mounting said tongue member in a position substantially parallel with the path of travel of the towed mobile frame.

3,905,620

TRAILERS

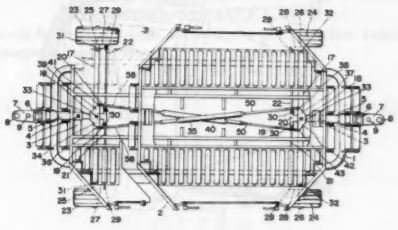
Masato Yokoyama, Osaka, Japan, assignor to Kabushiki Kaisha Suehiro Sharyo Seisakusho, Osaka, Japan

Filed Dec. 7, 1973, Ser. No. 422,980

Claims priority, application Japan, Dec. 15, 1972, 47-144692

Int. Cl.² B60D *3/00;* **B62D** *13/04*

U.S. Cl. 280—419 **1 Claim**



1. A trailer comprising in combination:

a frame,

front wheels and rear wheels on said frame,

coupler means mounted on said frame at the front end portion and the rear end portion thereof,

swingable members each rotatably connected, at one end portion thereof, to a mid portion of a respective one of said coupler means,

a pair of interlocking means, one end of each interlocking means being pivotally connected to the other end portion of one of said swingable members with the one end of one of said interlocking means being connected to one lateral side and the one end of the other one of said interlocking means being connected to the other lateral side of the other end portion of said one swingable member, and the other end of each of said interlocking means being pivotally connected to the other end portion of the other one of said swingable members with the other end of each of said interlocking means being connected to the lateral side, of the other end portion of the other one of said swingable members, which is opposite to the lateral side to which its respective one end is connected to the other end portion of said one swingable member,

actuator rod means connected to said swingable members to steer said front wheels and said rear wheels, and

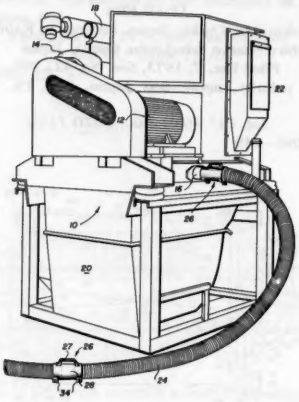
said interlocking means each comprise a cylindrical casing, a cylinder slidably disposed in said cylindrical casing, said cylinder having a cylinder head at one end thereof, a piston rod extending through the cylinder and fixed at one end thereof to one end of said cylindrical casing, a helical spring extending around said piston rod in said cylindrical casing, a piston secured to said piston rod, said piston dividing said cylinder into two cylinder chambers, means defining a fluid passage in said piston for fluidly communicating said two cylinder chambers, a plug secured fluid-tightly to one of said cylinder chambers, said plug having means defining an oil inlet port therein, said plug further having means defining a groove therein to thereby communicate said one cylinder chamber with said oil inlet port.

3,905,621

HOSE COUPLING OR ADAPTER FOR INDUSTRIAL VACUUM UNITS

Thomas M. DeMarco, Chicago, Ill., assignor to NFE International, Ltd., Arlington Heights, Ill.

Filed July 26, 1974, Ser. No. 492,047
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—7 10 Claims



1. In an industrial vacuum system, a coupling for joining together two sections of plastic tubing having different diameters, the improvement comprising:

a longitudinally divided thin sheet housing having a truncated, cone shaped portion and having axially spaced end portions suitable to receive sections of tubing telescoped therein and said end portions of the housing having an inside surface for frictionally engaging the associated telescoped tubing;

said coupling housing including axially extending edges including an inner edge and an outer edge for overlapping the inner edge and for positioning the inner edge adjacent the inside surface of the coupling housing, said outer edge having means to prevent injury to personnel handling the coupling;

clamping means positioned at each end of the housing and having hand operable tightening means and also having arcuate connecting portions including means attached to each end portion of said coupling housing, and, each arcuate connecting portion having a length extending for at least 45° to distribute sealing and connecting forces around the coupling periphery at each end of the coupling whereby each end of the coupling is radially movable inwardly upon tightening of said clamping means to grip the underlying periphery of the associated tubing section in sealing and fastening relationship.

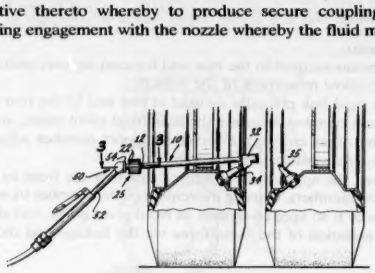
3,905,622

ADAPTOR UNIT FOR USE WITH FLUID NOZZLES

Michael J. Donley, Van Nuys, Calif., assignor to Alan Scott, Los Angeles, Calif.

Filed Jan. 28, 1974, Ser. No. 436,969
Int. Cl.[2] F16L *17/00, 19/00*
U.S. Cl. 285—338 7 Claims

1. As an article of manufacture, an adaptor means adapted to be sealingly connected to a fluid nozzle, adapted for delivering fluid to another point, said adaptor means comprising: a body including a part extendible into the fluid nozzle, said means including a fitting extending into said part and movable relative thereto whereby to produce secure coupling and sealing engagement with the nozzle whereby the fluid may be



delivered to the fitting, said part being constructed to be expandible by relative movement of said fitting into it.

3,905,623

PIPE COUPLING WITH DEFORMABLE OUTER SLEEVE

Thomas R. Cassel, 226 Shirley, Birmingham, Mich. 48009

Filed Apr. 5, 1974, Ser. No. 458,158
Int. Cl.[2] F16I *13/14*
U.S. Cl. 285—382 14 Claims

1. In a pipe coupling of the type comprising an outer pipe and an inner pipe extending into one end portion of the outer pipe, an end portion of the inner pipe having a peripheral length on the outer surface which is greater than the peripheral length of the opposed inner surface on the end portion of the outer pipe, force applying means adapted to act between the pipe ends for deforming the outer pipe end to change the cross-sectional dimensions thereof and produce a close fitting engagement with the inner pipe end wherein the inner pipe end is in compressive stress and the outer pipe end is in tensile stress, the improvement wherein the wall of said outer pipe end is of roundish cross-section except for at least one sector of increased radius defining an inwardly opening, axially extending channel, the wall of said inner pipe end is of roundish cross-section except for at least one wall-extension sector of increased radius defining a spline portion, said inner pipe end extending into said outer pipe end with said spline portion in said channel in loose fitting engagement with the pipe ends in an unstressed condition, the peripheral length on the inner surface of a cross-section of said channel being less than the peripheral length on the outer surface of a cross-section of said spline portion, said force applying means comprising fastener means having a shank extending through said channel with a movable element on at least one end reacting on said channel whereby tightening of the fastener means draws the wall of the channel toward the spline portion and the outer pipe end is stretched over the inner pipe end.

3,905,624
HOOD LATCHING DEVICE FOR AUTOMOTIVE VEHICLES

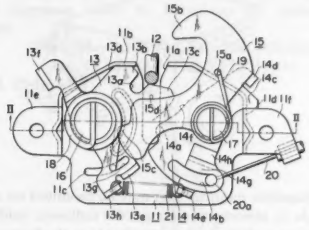
Masatoshi Fujita, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Nov. 11, 1974, Ser. No. 522,867

Claims priority, application Japan, Nov. 30, 1973, 48-134556

Int. Cl.² E05C *19/12*

U.S. Cl. 292—11 **7 Claims**



1. A hood latching device for an automotive vehicle having an openable hood, comrising: a striker secured to the hood; a base plate secured to the vehicle; a first latch member pivotally mounted on the base plate so as to be rotatable between an unlatching position and a latching position and having a first engaging portion engageable with the striker and a catch portion; a second latch member pivotally mounted on the base plate so as to be rotatable between a striker-arresting position and a non-arresting position and having a hook portion also engageable with the striker to arrest the same in said arresting position and a second engaging portion; a pawl member pivotally mounted on the base plate and having a third engaging portion engageable with the first engaging portion of the first latch member in said latching position of the same for assuring latching engagement between the striker and the first engaging portion of the first latch member; and catch means provided on the pawl member and being operative to abut against said second latch member to displace the same to said arresting position when an angular displacement of the pawl member is caused due to disengagement of the third engaging portion of the pawl from the first engaging portion of the first latch member; said catch portion of the latch member being operative to engage said second engaging portion of the second latch member, when the first latch member is rotated to said unlatching position, thereby to prevent the second latch member from rotating to said non-arresting position.

3,905,625
SAFETY CATCH FOR CRIB DROP SIDES

Robert G. Bryant, Gardner, Mass., assignor to Gem Industries Inc., Gardner, Mass.

Filed Feb. 25, 1974, Ser. No. 445,261

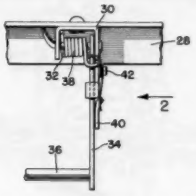
Int. Cl.² E05C *19/10*

U.S. Cl. 292—128 **6 Claims**

1. In a crib having a stabilizer bar and a drop side, a catch on the drop side and latching means on the stabilizer bar,

said latching means comprising a lever pivoted to the stabilizer bar, a relatively heavy spring biasing said lever in a direction toward the catch,

and a latch, said latch comprising a lever, a pivot mounting the latch lever, a light spring tending to urge the latch lever toward the catch, means on said latch lever for receiving said catch and holding the same in latched position, and means adapted to move the latch lever out of engagement with the catch upon motion of said first lever in the direction away from the catch,



said levers being on parallel axes and being swingable in parallel planes.

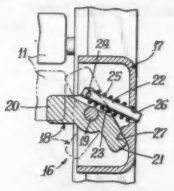
3,905,626
WINDSHIELD STORAGE LATCH

Kenneth R. Myers, Aurora, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Dec. 26, 1973, Ser. No. 428,391

Int. Cl.² E05C *3/26*

U.S. Cl. 292—216 **10 Claims**



1. In an operator's cab for a vehicle having a windshield movably mounted thereon for guided upward movement from a closed position to an open position, the invention comprising at least one releasable latch means, pivotally mounted on said cab by first pivot means, for permitting said windshield to move thereby upon engagement therewith when said windshield is moved upwardly to its open position and for thereafter automatically pivoting to a positive blocking disposition beneath said windshield upon disengagement therewith to prevent downward movement of said windshield from such open position, said latch means comprising a generally L-shaped latch member pivotally mounted on said cab, said latch member comprising first and second legs each pivotal into the path of movement of said windshield and a first stop means for engaging said second leg when said latch member pivots to dispose said first leg into the path of movement of said windshield.

3,905,627
DOOR LOCK MECHANISM

Masatoshi Fujita, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 15, 1974, Ser. No. 433,485

Int. Cl. E05c *3/26*

U.S. Cl. 292—216 **7 Claims**

1. A door lock mechanism comprising:

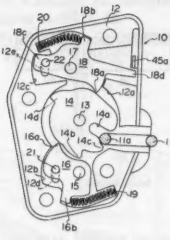
a rotatable latch engageable with a striker;

a first pawl engageable with said latch for maintaining said latch in a locking position and biased by a first biasing means in one direction;

means in said lock mechanism responsive to the rotational movement of said latch when the door is closed;

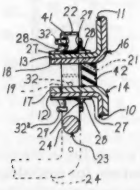
an exterior door opening means for releasing said engagement between said first pawl and said latch;

an interior door opening means for releasing said engagement between said first pawl and said latch; and



means for preventing and limiting only said door opening operation of said interior door opening means in response to said means responsive to the rotational movement of said latch.

3,905,628
LATCH ASSEMBLY
Raymond L. Lancaster, Cullman, Ala., assignor to Lanson Industries, Inc., Cullman, Ala.
Filed Mar. 1, 1974, Ser. No. 447,080
Int. Cl.[2] E05C *3/04*
U.S. Cl. 292—257 **4 Claims**



1. In a latch assembly for detachably attaching a first flange-like member to a second flange-like member,

a. there being an opening through said first flange-like member disposed to move into alignment with an opening through said second flange-like member,

b. a rotatable actuating member extending through said opening through said second flange-like member and having an end portion disposed to move selectively to a latched position through said first flange-like member and to an unlatched position away from said first flange-like member,

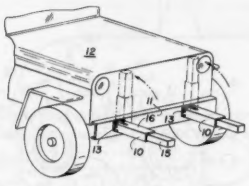
c. at least one cam member carried by the outer surface of said first flange-like member adjacent the opening therethrough and having an outwardly sloping cam surface,

d. a second cam member having an outwardly sloping cam surface carried by the outer surface of said second flange-like member ajdacent the opening therethrough,

e. a first lateral projection carried by said end portion of said actuating member of a size and shape to engage said cam surface carried by said first flange-like member and move said first flange-like member to latched position toward said second flange-like member upon rotation of said actuating member an angular distance in one direction and to move through said opening through said first flange-like member to unlatched position adjacent the inner surface of said second flange-like member upon rotation of said actuating member an angular distance in the opposite direction whereby said actuating member is attached to said second flange-like member at all times, and

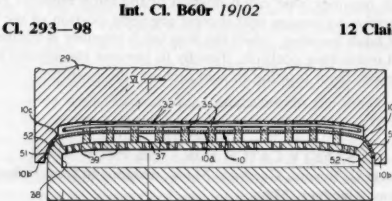
f. a second lateral projection carried by said actuating member in position to engage said cam member carried by said second flange-like member upon rotation of said actuating member in said one direction.

3,905,629
IMPACT REDUCER FOR VEHICLES
Luen Kwong, Oakland, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed May 2, 1974, Ser. No. 466,250
Int. Cl.[2] B60R *19/00*
U.S. Cl. 293—24 **3 Claims**



1. A collapsible member that may be mounted on a bumper of a vehicle to absorb the energy of a collision, said member fastened to a bracket which is attachable to the bumper so that the collapsible member may be alternately stored in a retracted position adjacent to the bumper to which the bracket is attached, or extended automatically prior to collision to project ahead of the attached bumper, in which the collapsible member includes a housing fastened to the bracket and an extendable section, with said extendable section protruding through the end of the housing, together with a compression spring in the housing which bears against the extendable section, together with frangible means that retains the collapsible member in the retracted position, said frangible means shaped to fracture under the inertia force caused by a high deceleration applied to the collapsible member by virtue of a rapid braking action of the attached vehicle, said inertia force causing the collapsible member to move to the extended position so that the extendable member will absorb the energy of a collision which occurs after the onset of such deceleration.

3,905,630
LIGHTWEIGHT, LOW COST IMPACT RESISTANT BUMPERS
Ronald G. Cantrell, Birmingham, Mich., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Feb. 11, 1974, Ser. No. 441,064
Int. Cl. B60r *19/02*
U.S. Cl. 293—98 **12 Claims**



1. A bumper bar adapted to be mounted protectively horizontally across an end of an automotive vehicle, comprising: the bar being formed from easily workable relatively thin gauge sheet or strip steel and having a bumper shell profile providing a horizontally elongated body portion with spaced apart integral upper and lower flanges of substantial width extending freely angularly away from the body portion;

opposite end portions on the body portion and turned angularly away from the body portion in the same direction as said flanges;

said body portion and said flanges being heat and quench hardened along their major extent and providing the bar with beam strength and yield strength to withstand bending stresses from repeated impact forces of a high order of magnitude without significant damage; and

said opposite end portions being substantially free from heat and quench hardening and thereby serving as warpage control areas for maintaining the bumper bar free from detrimental warpage.

3,905,631
MAGNETIC FISHING TOOL

Tom E. Ricks, 4306 Durango, Odessa, Tex. 79760, and Albert Jack Sherman, 1803 W. Broadway Pl., Hobbs, N. Mex. 88240

Filed May 13, 1974, Ser. No. 469,464
Int. Cl.² B66C *1/04*; E21B *31/06*
U.S. Cl. 294—65.5 **6 Claims**

1. A magnetic fishing tool, comprising, in combination:

a. a body member having a first portion connectible to a pipe string and a second portion connected to the first portion and partially cut away along a plane extending from the first portion; and

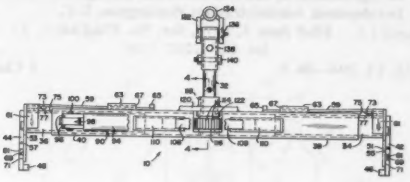
b. magnetic means arranged on the cut-away part of the second portion for attracting and holding magnetizable objects, the first portion being a hollow cylinder and the cut-away part of the second portion being a hollow semi-cylinder, the magnetic means including an arcuate member conformingly arranged in an inner surface of the semi-cylinder.

3,905,632
PALLET HEAD LOADER

Henry J. Caylor, Brandon, and Marion P. Ives, Winter Haven, both of Fla., assignors to Transcinor, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 249,405, May 1, 1972, abandoned. This application July 5, 1973, Ser. No. 376,690
Int. Cl.² B66C *1/66*
U.S. Cl. 294—67 R **10 Claims**

1. A gripping head of the type connected to a boom mechanism and designed to load and position containers or the like, said head comprising: a head frame; a pair of lifting arms connected to said frame: gripping means connected adjacent the outer ends of each arm: release means movably mounted on said head adjacent said gripping means and movable between a release and a non-release position, said release means comprising release plate means movably mounted on said frame relative to said gripping means, riser means connected to said release plate means and positioned to movably engage said frame upon movement of said one arm, whereby engagement of said riser and said frame causes movement of said plate means relative to said gripping means; at least one of said arms slidingly engaging said frame and movably arranged relative to said other arm; arm extending means mounted on

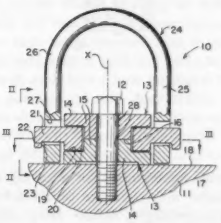


said frame and connected at least to said one arm; and a support shaft interconnecting said head to the boom, whereby actuation of said arm extending means causes positioning of said head relative to a container being loaded.

3,905,633
SWIVEL MOUNTED LIFTING EYE FOR ENGINES

Larry A. Larson, Peoria, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Sept. 30, 1974, Ser. No. 510,582
Int. Cl.² B66C *1/10*, *1/24*
U.S. Cl. 294—82 R **9 Claims**



1. A lifting eye arrangement disposed on a central longitudinal axis thereof and adapted for attachment to an engine block or the like comprising

a pair of annular members each comprising a base portion and a cylindrical hub portion formed integrally on one side of said base portion, the outside diameter of each of said hub portions being substantially less than the corresponding outside dimension of a respective base portion, the hub portions of said members disposed in back-to-back relationship to define a common annular groove circumferentially about said hub portions and axially between said base portions,

a ring member rotatably mounted in said groove and having a pair of diametrically opposed lugs extending radially outwardly therefrom beyond said members,

a U-shaped lifting eye having a pair of legs each pivotally mounted on a respective one of said lugs,

a flange secured on the end of each of said lugs to extend in the direction of said axis and disposed on an outboard side of a respective one of said legs, and

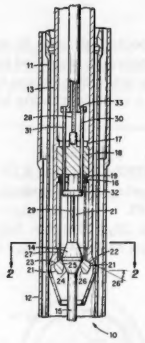
an elongated slot formed through each leg of said lifting eye to extend in the direction of said axis along such leg, each of said lugs mounted in a respective one of said slots and wherein the axial distance between a lower end of said flange and an opposite side of a base portion of an adjacent base member, opposite to the side thereof having said hub portion thereon, is less than the axial distance between a lower end of said slot and the end of the leg carrying said slot.

3,905,634

QUICK RELEASE LATCH FOR REACTOR SCRAM

Melvin L. Johnson, Wichita, Kans., and Bruce M. Shawver, San Jose, Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,184
Int. Cl.[2] G21C 7/08
U.S. Cl. 294—86 A 5 Claims



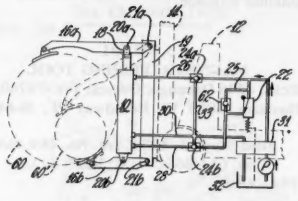
1. A quick release mechanism for allowing rapid insertion of a control element into the core of a nuclear reactor for scram purposes comprising: a hollow drive member having a diverging-converging end section, a gripper assembly movably positioned within said hollow drive member and adapted to cooperate with a coupling head of an associated control element, and means including tensioning means for moving said gripper assembly such that tensioning said tensioning means causes said gripper assembly to retain an associated control element coupling head therein and release of tension on said tensioning means allows such a retained associated control element to be released therefrom for rapid insertion into an associated reactor core, said hollow drive member being provided with a pair of axially spaced inwardly protruding portions, said diverging-converging section of said hollow drive member including a cam surface of a prescribed angle, said gripper assembly comprising a plurality of collet grippers, each of said collet grippers having an outer surface at one end thereof configured to cooperate with said cam surface, each of said collet grippers being connected at an end opposite said one end to a force transmitting member, said force transmitting member being located intermediate and movable between said inwardly protruding portions of said hollow drive member, said tensioning means being connected to said force transmitting member, and said collet grippers each having an inner surface at said one end configured to cooperate with an adjacent surface on a retained control element coupling head, whereby tensioning of said tensioning means moves said force transmitting member from contact with a lower of said pair of inwardly protruding portions of said hollow drive member into contact with an upper of said protruding portions causing movement of said collet grippers toward said lower one of said protruding portions and into contact with said cam surface such that said collet grippers contact and retain therebetween an associated control element coupling head.

3,905,635

MATERIAL GRASPING CLAMP ASSEMBLY

Ernst S. Esser, Levittown, Pa., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 10, 1973, Ser. No. 322,341
Int. Cl.[2] B66F 9/18
U.S. Cl. 294—88 7 Claims



1. A material grasping clamp assembly for a material handling vehicle comprising:

a pair of opposed clamp members with at least one of said clamp members being movable toward the other to retain variable size material matter between said pair of clamp members;

means for mounting said clamp members to said material handling vehicle;

means for moving said clamp members relatively toward one another at one pressure prior to retaining of material between said pair of clamp members to effect speedy closure of said clamp assembly and applying a second increased pressure to said clamp members thereafter to retain material therebetween;

said moving means further including a direct acting fluid motor having a main piston movable at one speed within a main cylinder cavity under the action of said first pressure, a secondary piston movable within a secondary cavity independent of the first cavity and having a shaft received within a cavity in said main piston upon application of said first pressure to said secondary piston, a pump communicating with said main cylinder cavity and said secondary cavity to produce said first pressure on said main piston and said secondary piston, and a sequence valve assembly connected between said pump and said secondary cavity to provide said first pressure to said secondary piston whenever said clamp members retain said material between them, the relationship of the working areas of said pistons being such as to produce said increased pressure on said main piston.

3,905,636

EQUIPMENT FOR MOVING MATERIAL ON REELS, IN PARTICULAR PAPER REELS AND THE LIKE

Gunnar J. Westerlund, Brasschaat, Belgium, assignor to AB Hagglund & Soner, Ornskoldsvik, Sweden

Filed Nov. 28, 1973, Ser. No. 419,779
Int. Cl. B66c 1/54
U.S. Cl. 294—95 3 Claims

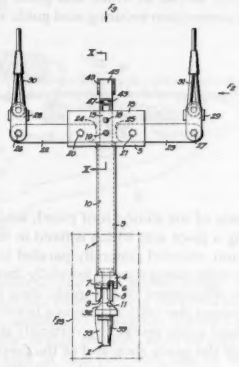
1. Equipment for moving material on reels, more particularly paper reels and the like, provided with a passage therethrough, said equipment including:

hoisting means;

a hollow outer component having an upper part provided with a transverse supporting plate and lower part provided with a set of outwardly swingable fingers, said supporting plate being adapted to support said outer component on said reel when said outer component is introduced into said passage;

an inner component movable within said outer component and having an upper part provided with a lever mechanism and a lower part provided with means to control the angular displacement of said swingable fingers, said lever

mechanism including two lever arms which are pivoted to said upper part of said inner component, said lever arms having first ends which are coupled to said hoisting means and other ends which are cam-shaped and cooperable with said supporting plate to displace said inner and outer



components relative to each other in order to bring said control means in operative engagement with said swingable fingers or retract said control means from operative engagement with said fingers; and

means to lock and to release said inner and outer components against movement with respect to each other.

3,905,637

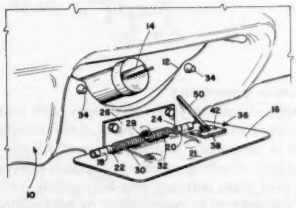
ATTACHMENT FOR VEHICLE LICENSE PLATE HOLDER

Ennis Dean Smith, Claremore, Okla., assignor to Kain's Research and Development Company, Inc., Bartlesville, Okla.

Filed Oct. 1, 1973, Ser. No. 402,386

Int. Cl. B62d *25/00*

U.S. Cl. 296—1 C **2 Claims**



2. For use with a license plate holder hingedly secured to the vehicle and having alternate raised and lowered positions, an attachment comprising a plate member secured to the inside surface of the holder, an elongated finger means pivotally secured to the plate member, the pivotal axis thereof being at an angle substantially less than 90° with respect to the holder and said pivotal axis also lying in a plane which is perpendicular to the axis of the holder hinge, said finger means being movable between an extended position where the finger is disposed at an acute angle with respect to the holder for engaging the vehicle when the holder is in the lower position and a retracted position whereby the finger means is disposed substantially parallel to the holder when said holder is in its raised position.

3,905,638

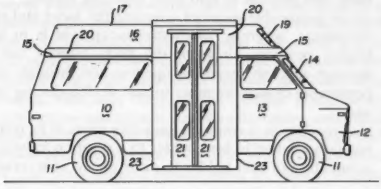
TOP AND SIDE DOOR VAN CONVERSION ASSEMBLY

George J. Persico, Warren, Ohio, assignor to Recreational Industries Inc., Warren, Ohio

Filed May 22, 1974, Ser. No. 472,301

Int. Cl.² B62C *1/06*

U.S. Cl. 296—26 **3 Claims**



1. A top and side door conversion assembly for a van having a body with front, back and side walls with an open top and an opening in one of said side walls, said top and side door conversion assembly comprising a generally horizontal top portion with integral secondary front, back and side walls depending therefrom, said secondary front, back and side walls on said top portion arranged to register with and be secured to said front, back and side walls of said van body to close the open top thereof and increase the interior height of said van body, a door frame attached to and depending from said top portion and located in a secondary opening in one of the secondary side walls thereof and in registry with said opening in said side wall of said van body to form a doorway, movable doors in said door frame arranged to open and close the doorway, portions of said door frame engaged on and secured to said side wall of said van body at the sides of said opening therein so as to form with said doors a closure for said openings in said side wall of said body and secondary side wall of said top portion of said conversion assembly, said door frame having a horizontal lower portion forming a step and said door frame being on a substantially vertical plane with some of said door frame being offset outwardly of the adjacent side walls of said van body.

3,905,639

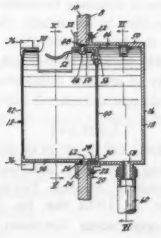
VENTILATED ASHTRAY FOR AUTOMOBILES

Michael D. Montgomery, 702 Forest, Olathe, Kans. 66061

Filed May 7, 1973, Ser. No. 357,592

Int. Cl.² B60S *1/64*

U.S. Cl. 296—37 R **8 Claims**



1. An ashtray system for an automobile comprising:

a. an ash receptacle adapted to be mounted interiorly of the body of said automobile for use by its occupants,

b. means operable to induce a draft from the vehicle interior, through said ash receptacle, and to discharge it exteriorly of the vehicle body,

c. a holder for said receptacle adapted to be mounted inside a wall of the body of the vehicle, and opening into the interior of said body, said receptacle being mounted in said holder for movement between an extended position projecting into the body interior, and a closed position generally enclosed within said holder, and having an ash reception opening in the portion thereof exposed when in its extended position, said holder being connected at its inner end portion to said draft inducing means,

d. an air permeable member covering the inner end of said receptacle, whereby when said receptacle is in its extended position, air from the body interior can pass through said ash reception opening and through said air permeable closure member to said draft inducing means, and

e. said receptacle is rotatably movable when in its retracted position relative to said holder to a position in which the connection of said holder to draft means is severed.

3,905,640

LEVEL ADJUSTING DEVICE FOR SLIDING ROOFS

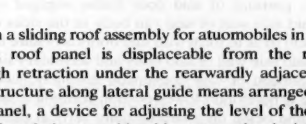
Alfons Lutz, Emmering, Germany, assignor to Webasto-Werk W. Baier KG, Stockdorf, Munich, Germany

Filed Mar. 8, 1974, Ser. No. 449,387

Claims priority, application Germany, Mar. 9, 1973, 2311624

Int. Cl. B60j *7/04*

U.S. Cl. 296—137 F **10 Claims**



1. In a sliding roof assembly for atuomobiles in which a rigid sliding roof panel is displaceable from the roof opening through retraction under the rearwardly adjacent stationary roof structure along lateral guide means arranged underneath said panel, a device for adjusting the level of the sliding roof panel in relation to said guide means, the device comprising in combination:

a lateral guide profile as part of said lateral panel guide means having opposing guide faces adapted to provide vertically determined guidance;

a guide shoe having at least one guide face engaging said guide profile;

a guide shoe carrier to which said guide shoe is connected;

a pivot connection between said guide shoe carrier and the rigid sliding roof panel having its pivot axis fixed in relation to the roof panel and so oriented that an angular adjustment of the guide shoe carrier about said axis changes the vertical distance between said panel and the lateral guide profile, by vertically displacing the guide shoe relative to the level of the pivot connection; and

means for releasably locking said pivot connection in any one of a plurality of angular adjustment positions.

3,905,641

LEVEL ADJUSTING DEVICE FOR SLIDING ROOFS

Horst Bienert, Gauting, Germany, assignor to Webasto-Werk W. Baier KG, Stockdore, Munich, Germany

Filed Mar. 18, 1974, Ser. No. 452,281

Claims priority, application Germany, Mar. 17, 1973, 2313453

Int. Cl. B60j *7/04*

U.S. Cl. 296—137 F **8 Claims**

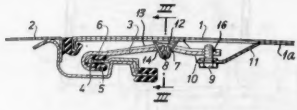
1. In a sliding roof assembly for automobiles in which a rigid sliding roof panel is displaceable from the roof opening through retraction under the rearwardly adjacent stationary roof structure along lateral guide means arranged underneath said panel, a device for adjusting the level of the sliding roof panel in relation to said guide means, the device comprising in combination:

a lateral guide profile as part of said lateral panel guide means having opposing guide faces adapted to provide vertically determined guidance;

a guide shoe having at least one guide face engaging said guide profile;

a guide shoe carrier to which said guide shoe is connected;

a pivot connection securing said guide shoe carrier to the



underside of the sliding roof panel, said pivot connection defining a pivot axis which is fixed in relation to the roof panel and oriented generally parallel to the lateral guide profile while being spaced inwardly therefrom, so that an angular adjustment of the guide shoe carrier about said axis changes the vertical distance between said panel and the lateral guide profile, by vertically shifting the relative levels of the guide shoe and of the pivot connection; and

spindle means for angularly adjusting the guide shoe carrier about said pivot axis.

3,905,642

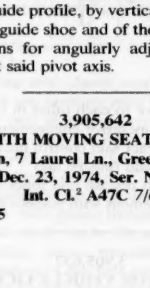
CHAIR WITH MOVING SEAT AND MIRROR

Luther G. Simjian, 7 Laurel Ln., Greenwich, Conn. 06830

Filed Dec. 23, 1974, Ser. No. 535,156

Int. Cl.[2] **A47C** *7/62*

U.S. Cl. 297—185 **15 Claims**



1. A chair comprising:

the stacked assembly of a stationary base plate, a rotatably mounted mirror support plate, a rotatably mounted seat, and a stationary bearing support means supporting a plurality of rolling members disposed between said mirror support plate and said seat for causing rotation imparted to said seat to be transmitted by said rolling members to said mirror support plate to effect counterrotation thereof;

a support arm secured with one end to said mirror support plate for motion therewith, said arm radially extending from said mirror support plate rearwardly of said seat and supporting at its distal end a bracket adapted to undergo pivotal motion relative to said support arm;

means extending from said bracket for supporting a mirror above the height of said seat and in a generally vertically disposed plane;

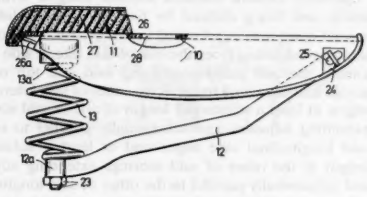
cam means disposed on said base plate, and

linkage means coupling said cam means to said bracket for pivoting said bracket and the face of the mirror supported by said bracket from a central position responsive to the rotation of said seat and said mirror support plate.

3,905,643
SADDLE

Klaus Lamkemeyer, Guetersloh, Germany, assignor to Mertens & Co. Kommanditgesellschaft, Guetersloh-Westfalen, Germany

Filed Nov. 2, 1973, Ser. No. 412,305
Claims priority, application Austria, Nov. 2, 1972, 9327/72
Int. Cl.[2] B62J *1/00*
U.S. Cl. 297—195 **11 Claims**

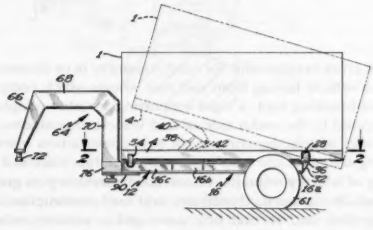


1. A bicycle saddle including a saddle bridge portion and having a carrier part and helical spring elements located in the rear region of the saddle and extending between said carrier part and said saddle bridge portion, each of said spring elements being provided at one end with one or more thread convolutions forming a ring portion, said ring portion being of reduced diameter relative to the major portion of the spring element, said carrier part having a threaded extension on its underside providing a securing member for said ring portion of each of said spring elements, said threaded extension being made integral with said carrier part from plastic material, said spring element ring portion being threaded to said threaded extension, said spring element having another end and said saddle bridge having an eyelet therein receiving said spring element other end, and a threaded fastener element passing through said spring element other end and having a detachable fastener thereon engageable with said eyelet to secure said spring element to said saddle bridge.

3,905,644
TRAILER FRAME STRUCTURE

Leon G. Feterl, Salem, S. Dak., assignor to SOS Consolidated, Inc., Birmingham, Mich.

Filed Feb. 4, 1974, Ser. No. 439,397
Int. Cl. B60p *1/16*
U.S. Cl. 298—22 AE **8 Claims**



1. In combination with a tilt bed trailer having a truck body mounted on a tilt bed, an improved chassis and tilt bed support structure comprising:

a tilt bed frame comprising a pair of elongated, laterally spaced body support beams affixed to the underside of the truck body along opposite sides thereof, said body support beams being connected at spaced points along their length by bar members extending transversely of said truck body;

a chassis structure underlying said tilt bed frame and comprising a pair of elongated, laterally spaced frame beams extending generally lengthwise of said truck body and interconnected at longitudinally spaced points by cross bar members, said elongated frame beams comprising a pair of relatively widely spaced rear beam segments, a pair of intermediate beam segments angling inwardly and forwardly from the front ends of said rear beam segments, and a pair of relatively closely spaced front beam segments extending forwardly from the front ends of said intermediate beam segments, said front beam segments being substantially parallel to said rear beam segments and spaced apart along a width dimension substantially equal to the width dimension between said body support beams, with said body support beams being pivotally mounted on said chassis structure for raising and lowering movement about a substantially horizontal axis by lift means operatively associated therewith, the forward ends of said body support beams being in vertical alignment with said front beam segments of said chassis frame beams and being supported thereon when said tilt bed frame is in its downwardly pivoted travel position and with the rear ends of said body support beams lying between said rear beam segments of said chassis frame beams in inwardly spaced relation thereto;

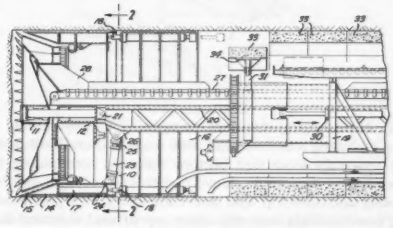
an axle extending transversely of said chassis structure in underlying, supporting relation thereto, and wheels on opposite ends of said axle; and

hitch means secured to the forward end of said front beam segments.

3,905,645
TUNNELLING MACHINES

John Bland, London, England, assignor to Sir Robert McAlpine & Sons Limited, London, England

Filed Apr. 18, 1974, Ser. No. 461,924
Claims priority, application United Kingdom, Apr. 30, 1973, 20486/73
Int. Cl.[2] E21C *29/00*; **E21D** *9/08*
U.S. Cl. 299—31 **9 Claims**



1. A tunnelling machine for boring a circular tunnel in the earth comprising:

i a cylindrical shield for supporting the wall of a tunnel as it is bored with the shield having a forward and rearward end;

ii a plurality of hydraulic rams;

iii means mounting the rams on the shield for reacting against fixed means in the tunnel behind the shield to advance the shield;

iv a cutting head;

v means mounting the cutting head at the forward end of the shield for rotation about the central axis of the shield to cut the tunnel;

vi a sole plate attached to the cylindrical shield adjacent the forward end of the shield and at the lowest part of the shield;

vii a sledge;

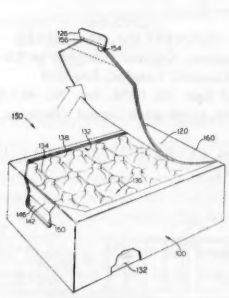
viii means to allow the sledge to move along the tunnel behind the shield supported by the floor of the tunnel;
ix a steering arm;
x means to pivotally attach one end of the arm to the shield adjacent the longitudinal axis of the shield;
xi means to support the other end of the steering arm on the sledge such that the whole reaction from the steering arm is always taken by the sledge;
xii a single pair of hydraulic steering jacks;
xiii means pivotally connecting one end of each of the hydraulic jacks to the steering arm, and
xiv means pivotally connecting the other end of each of the hydraulic jacks to the periphery of the shield at the lower part of the shield, one each side of the shield, each jack being inclined at an acute angle to the vertical as viewed along the longitudinal axis of the shield, so that the angle between the steering arm and the longitudinal axis of the shield may be controlled by the jacks to steer the machine by pivoting it about the sole plate.

3,905,646

PACKAGING STRUCTURE AND BLANK FOR CONTAINER COVER

Warren A. Brackmann, Cooksville; Arthur K. Bunnell, and Karel Hrboticky, both of Etobicoke, all of Canada, assignors to Carling O'Keefe Limited, Toronto, Canada

Continuation-in-part of Ser. No. 330,197, Feb. 7, 1973. This application Mar. 12, 1974, Ser. No. 450,339
Int. Cl.[2] B65D *5/54, 5/48*
U.S. Cl. 229—51 TC **12 Claims**



1. A packaging structure comprising a substantially rigid tray including a bottom wall, side walls and end walls extending upwardly from siad bottom wall and terminating in an open top, a disposable sleeve constructed of light cardboard closing said open top, said sleeve including a top panel extending coextensively with the open top of said tray and having first and second longitudinal side edges and first and second lateral side edges, side panels extending downwardly from said top panel in engagement with the outer surface of the side walls of said tray a distance substantially equal to the height of said side walls, end panels extending downwardly from said top panel in engagement with the outer surface of the end walls of said tray a distance substantially equal to the height of said end walls, said side and end panels being joined together, each of said end walls of said tray having a slot formed therein of longer dimension extending transverse of said end wall,

said tray including a divider means dividing the space therein into a plurality of beverage bottle containing compartments, and said side walls and end walls extending upwardly a distance substantially equal to the height of said bottles, said top panel of said sleeve engaging the tops of said bottles,

said sleeve including first and second tab outlines in said end panels corresponding substantially to the shape of said slots, the portion of one of said tab outlines corresponding to the longitudinal periphery of the slot closest to the join of said top panel and the appropriate side panel being in the form of a first crease line and the remainder of said one tab outline being constituted by a first score line, the portion of the other of said tab outlines corresponding to the longitudinal periphery of the slot closest to the join of the top panel and the appropriate side panel being in the form of a second crease line and the remainder of said other tab outline being constituted by a second score line,

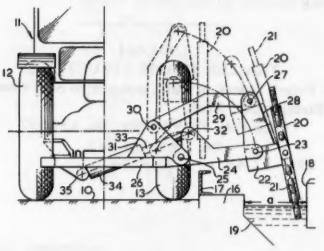
an openable closure element formed integral with said sleeve and being defined by first and second laterally spaced-apart scorings formed in said sleeve, each of said scorings extending from the one of said lateral side edges joining the end panel containing said one tab outline across said top panel towards the other of said lateral side edges, at least a substantial length of one of said scorings extending adjacent and substantially parallel to one of said longitudinal side edges and at least a substantial length of the other of said scorings extending adjacent and substantially parallel to the other of said longitudinal side edges, said scorings terminating one at each end of said second score line in the one of said end panels containing said other tab outline and attached to said top panel at said other lateral side edge, whereby, upon severing said second score line and pulling on said other tab the openable closure element is detached from the remainder of said sleeve along said first and second scorings, said openable closure element thereby being hinged about said one lateral side edge of said top panel.

3,905,647

CRUST-BREAKERS

Otto Alfarnes, and Knut Hauknes, both of Husnes, Norway, assignors to A/S Ardal og Sunndal Verk, Oslo, Norway

Filed Sept. 16, 1974, Ser. No. 505,978
Int. Cl.[2] E21C *33/00;* **C22D** *3/02*
U.S. Cl. 299—70 **15 Claims**

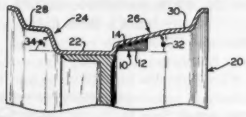


1. A crust-breaker unit for ready assembly in or disassembly from a vehicle having front and rear wheels which comprises a crust-breaking tool, a rigid supporting member adapted to be secured to the under side of said vehicle at positions adjacent said wheels thereof and an arm construction interconnecting said tool and said supporting member, said tool consisting of a freely rotatable wheel having breaker pins projecting radially outwards therefrom, said arm construction comprising first and second link arms and a pressure medium cylinder having at one end its piston rod connected to said first link arm and its other end connected to said supporting member, said cylinder being actuable to cause pivoting of said link arms about respective first and second stationary link points thereof forming additional connections with said supporting member at positions remote from said tool, said pivoting being in a vertical plane transversely of the longitudinal direction of the vehicle in which said unit is designed to be assembled whereby the tool can be swung from an inactive position close to the side of the vehicle to an outwardly swung working position and vice-versa.

3,905,648
WHEEL BALANCING WEIGHT AND COMBINATION THEREOF

Frank Oren Skidmore, Cuyahoga Falls, Ohio, assignor to Ann Gottwald, Akron, Ohio

Filed Aug. 5, 1974, Ser. No. 494,606
Int. Cl.[2] B60B *1/00, 27/00*
U.S. Cl. 301—5 B **7 Claims**



1. A balancing weight in combination with a rotatable pneumatic wheel which comprises:

an elongated lead based strip weight having a trapezoidal shape in cross-section with two long non-parallel sides and two substantially parallel ends, one end being shorter than the other,

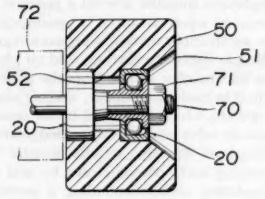
a drop center rim mounting a pneumatic tire to constitute the wheel, said rim having a tire supporting flange attached to the drop center and bead retaining edges on the flange to mount the tire and where the flange is conical in shape tapering outwardly from the drop center rim, and

means to secure the strip in position to radially inward surface of the flange with the shorter end adjacent and substantially parallel to the drop center.

3,905,649
WHEELS FOR ROLLER SKATES AND THE LIKE

Kazuhiro Kosono, and Yasukazu Kosono, both of No. 9-1, Asakusa 7-chome, Taito-ku, Tokyo, Japan

Filed May 30, 1973, Ser. No. 365,251
Int. Cl. A63c *17/22*
U.S. Cl. 301—5.7 **4 Claims**



1. A wheel ball bearing for a roller skate comprising:

a ring-shaped outer shell member produced from a single metal plate and being constituted by a peripheral portion of an annular configuration, first and second flanged end portions centrally extending integrally from the opposite ends of said peripheral portion, said first flanged end portion being substantially sufficiently larger in radial inward extent than said second one;

a first annular groove defined by said peripheral portion, and first and second flanged end portions;

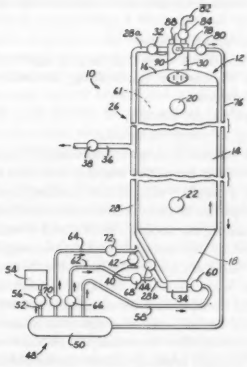
a plurality of steel balls received in said first annular groove in an annular arrangement; and,

a tubular sleeve member including a peripheral portion, a collar means radiating outwardly from connection therewith, the collar means comprising an inner annular ridge integrally formed on said sleeve member to define a second annular groove between itself and a radially outwardly extending flange provided at one end of the sleeve member for receiving said steel balls, said ridge being opposite to said first flanged end portion for cooperating therewith to prevent the departure of the sleeve member off the outer shell member, said radially outwardly extending flange being axially spaced from said collar means and being so large as to form, between a radially inner portion of this flange, said collar means and said peripheral portion of the tubular sleeve member, said second annular groove of such a depth as to receive therein a substantially major part of said steel balls, said sleeve member being fitted centrally of the annular arrangement of said steel balls so that said second flanged end portion is brought into relation opposite to said radially extending flange, for retaining said steel balls in said groove by said flanged end portions, said collar means and said radially extending flange.

3,905,650
MATERIAL TRANSFER SYSTEM

Billy P. Freeman, 5412 Parkridge Dr., Knoxville, Tenn. 37914

Filed Dec. 3, 1973, Ser. No. 421,212
Int. Cl. B65g *53/40*
U.S. Cl. 302—53 **9 Claims**



8. A system for conveying particulate material and the like, comprising, in combination, storage container means having an inlet and an outlet and being adapted to contain a quantity of particulate material, means connected to said inlet for introducing particulate material into said container means from a source, pneumatic pressure tank means adapted to be pressurized to a predetermined pressure level by a source of pneumatic pressure, first conduit means connecting said pressure tank means to said storage container means in a manner to effect selective pressurized discharge of material from said outlet of said container means and simultaneously establish an auxiliary pneumatic pressure zone in said container means when said pressure tank is pressurized to said predetermined pressure level, second conduit means directly interconnecting said pressure zone in said container means to said pressure tank means so as to effect pneumatic pressure flow from said auxiliary pressure zone to said pressure tank when the pressure level in said pressure tanks fall below said predetermined level, and means associated with said second conduit means to allow flow therethrough only in the direction toward said pressure tank.

3,905,651
BRAKE INSTALLATION FOR MOTOR VEHICLES, ESPECIALLY FOR BUSES

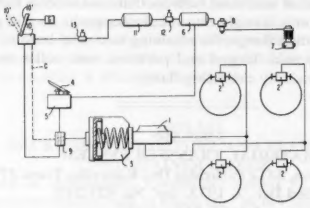
Walter Hornung, Stuttgart-Bad Cannstatt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 128,129, March 25, 1971, abandoned, which is a continuation of Ser. No. 842,636, July 17, 1969, abandoned. This application Dec. 21, 1973, Ser. No. 427,310

Claims priority, application Germany, July 17, 1968, 1755967

Int. Cl.[2] B60T *13/28, 13/68*

U.S. Cl. 303—2 **15 Claims**



1. A brake installation for motor vehicles comprising:

first compressed-air tank means having an air inlet and first and second air outlets,

air-compressor means connected to the air inlet of said first tank means,

hydraulic service brake means,

compressed-air amplifier means arranged upstream of said service brake means for controlling actuation of said service brake means,

a first braking air supply circuit,

a second braking air supply circuit,

a two way valve means arranged immediately upstream of said compressed-air amplifier means; said two way valve means having a single valve outlet leading to said compressed air amplifier means, a first valve inlet connected to said first braking air supply circuit, and a second valve inlet connected to said second braking air supply circuit; said two way valve means being movable between a first valve position with said first braking circuit communicated with said compressed-air amplifier means and said second braking circuit out of communication with said compressed-air amplifier means and a second valve position with said second braking circuit communicating with said compressed-air amplifier means and said first braking circuit out of communication with said compressed-air amplifier means,

said first and second braking air supply circuits being independent from one another and being communicated with the respective first and second air outlets of said first tank means such that flow of air in one of said circuits is substantially unaffected by flow of air in the other of said circuits,

driving brake control means for controlling the supply of compressed air to said two way valve means by way of said first braking circuit for accommodating service brake control during normal driving with said two way valve means in said first position,

and stop brake control means for controlling the supply of compressed-air to said amplifier means from said second braking circuit, said stop brake control means including a stop brake valve movable between a closed position blocking flow of compressed-air through said second braking circuit to said two way valve means and an open position communicating compressed-air to said two way valve means by way of said second braking circuit and switching means for switching said two way valve means to said second position whenever said stop brake valve is in said open position and for switching said two way valve means to said first position whenever said brake valve is in said open position.

3,905,652
AUTOMOTIVE BRAKE CONTROL SYSTEM

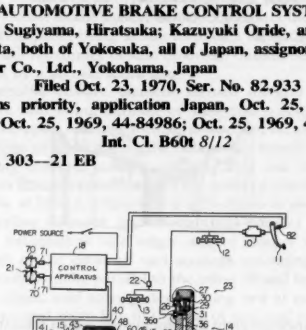
Hiroshi Sugiyama, Hiratsuka; Kazuyuki Oride, and Masaaki Morita, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 23, 1970, Ser. No. 82,933

Claims priority, application Japan, Oct. 25, 1969, 44-84985; Oct. 25, 1969, 44-84986; Oct. 25, 1969, 44-84987

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 EB **10 Claims**



1. A brake control system for a motor vehicle, comprising a master cylinder with a brake pedal, wheel cylinders, a fluid pressure network interconnecting said master cylinder and said wheel cylinders, a fluid pressure control unit for controlling fluid pressure leading to at least one of said wheel cylinders, said fluid pressure control unit including a housing having formed therein a cavity which forms a part of said fluid pressure network associated with said at least one wheel cylinder and accommodate therein a valve for controlling said fluid pressure leading to said at least one wheel cylinder, a diaphragm assembly having a chamber and a diaphragm dividing said chamber into first and second subchambers, said second subchamber being communicating with the intake manifold of the engine, a plunger extending from said diaphragm through said first subchamber and connected to said valve and a compression spring mounted in said second subchamber for biasing said diaphragm member toward a position in which said valve assumes its open position; a pneumatic control unit including an air chamber section, a pressure regulating section and a diaphragm operating section, said air chamber section including an air chamber vented from the atmosphere, an air valve mounted in said air chamber, said air chamber section having an opening which is defined by an annular valve seat on which said air valve is selectively seated, and a compression spring biasing said air valve to said annular valve seat for normally keeping said opening closed by said air valve, said pressure regulating section including a pressure regulating chamber communicating with said opening and with said first subchamber, a diaphragm member which defines said pressure regulating chamber and which has an opening, an annular valve seat mounted on the inner surface of said second diaphragm member, a compression spring mounted in said pressure regulating chamber and biasing said diaphragm member away from said opening, and a suction valve mounted in said pressure regulating chamber and connected rigidly to said air valve through a connecting rod, said suction valve being selectively seated on said annular valve seat against the action of the compression spring in said pressure regulating chamber, said diaphragm operating section including a vacuum chamber separated from said pressure regulating chamber by said diaphragm member of the pressure regulating section, a diaphragm chamber defined by an inner and outer diaphragm members, said outer diaphragm member being larger in working area than said inner diaphragm member, said inner dia-

phragm member separating said diaphragm chamber and said outer diaphragm member being exposed to the atmosphere, a connecting member rigidly connecting said inner and outer diaphragm members to said diaphragm member of said pressure regulating section, a conduit communicating with said air chamber and said diaphragm chamber, a first passage communicating with said diaphragm chamber and said intake manifold, a second passage communicating with said vacuum chamber and selectively with said first passage; a solenoid valve for controlling the communication between said first and second passages, said second passage being isolated from said first passage when said solenoid valve is deenergized whereby said inner and outer diaphragms and said diaphragm of said pressure regulating section are normally biased toward said suction valve, said suction valve being pressed upon said air valve when said second passage is permitted to communicate with said first passage with said solenoid valve energized whereby said pressure regulating chamber is caused to communicate with said intake manifold and the vacuum in said intake manifold is drawn into said first subchamber for moving said diaphragm member to a position in which said valve in said housing is urged to permit fluid communication in said housing; an electric control means electrically connected to said solenoid valve for energizing the same when actuated; and sensing means for sensing the revolution speeds of said at least one driving wheel and generating pulses the repetition rate of which is corresponding to the revolution speed of said at least one wheel, said electric control means being actuated when the angular wheel deceleration as detected from said revolution speed exceeds a predetermined level.

3,905,653

ANTI-LOCK CONTROL SYSTEM WITH COMMON HYDRAULIC STEP-BY-STEP VALVE

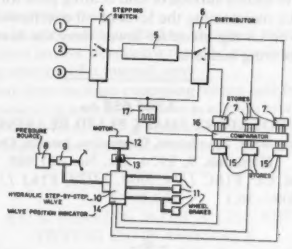
Paul Müller, Ziegelhausen, and Heinz Leiber, Leimen, both of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Oct. 2, 1973, Ser. No. 402,811

Claims priority, application Germany, Oct. 2, 1972, 2248266

Int. Cl.² B60T *8/06*

U.S. Cl. 303—21 F **24 Claims**



1. An anti-lock control system for the wheel brakes of a vehicle comprising: means for sensing the rotary behaviour of at least two wheels of said vehicle; an evaluation circuit means, responsive to the output signals from said sensing means, for producing control signals dependent on said sensed rotary behaviour of said at least two wheels; a plurality of individual brake channels connected to the wheel brakes of the vehicle wheels; a hydraulic step-by-step valve connected to all of said brake channels, said step-by-step valve having different passages for each of said brake channels which permit the variation of pressure with different selected gradients in each associated brake channel, and having different combinations of pressure gradients for said plurality of brake channels in its individual stepping positions; and means, responsive to said control signals produced by said evaluation circuit means, for adjusting the stepping position of said step-by-step valve to provide the desired different combinations of pressure gradients in said brake channels.

3,905,654

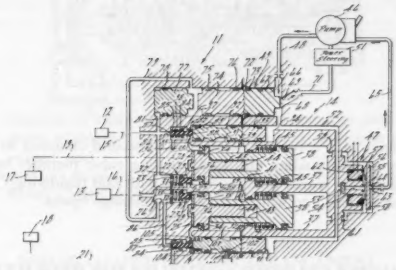
SKID CONTROL SYSTEM FOR DUAL BRAKE

Leonard T. Tribe, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 14, 1973, Ser. No. 415,816

Int. Cl.² B60T *8/04, 13/16*

U.S. Cl. 303—21 F **22 Claims**



1. In a brake system comprising a source of actuating fluid, a wheel brake and conduit means interconnecting said source with said wheel brake for actuating said wheel brake, the improvement comprising a skid control system interposed in said circuit between said source and said one wheel brake, said skid control system comprising valve means in said circuit movable between an open position permitting flow from said source to said wheel brake and a closed position restricting flow from said source to said wheel brake, power means responsive to a first signal for permitting said valve means to move from its opened position to its closed position to prevent a skid condition and responsive to a second signal for moving said valve means back to its opened position, said power means including an element having a first position in which said valve means is in its normal, opened position, a second position spaced from said first position in which said valve means is retained in its normal opened position and a third position in which said valve means may move from its normal opened position to its closed position, and means for delaying the opening of said valve means upon operation of said power means by said second signal, said delaying means being effective to require movement of said power means from its third position past its second position toward its first position before said valve means may move from its closed position to its opened position.

3,905,655

PRESSURE-MODULATION DEVICE APPLICABLE ESPECIALLY TO THE BRAKING CIRCUIT OF AN AUTOMOBILE VEHICLE AND A BRAKING CIRCUIT EQUIPPED WITH SAID DEVICE

Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 17, 1974, Ser. No. 470,731

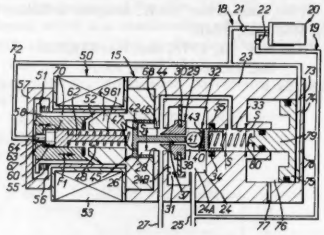
Claims priority, application France, May 24, 1973, 73.18900

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 F **7 Claims**

1. A modulating device for interposition between a hydraulic control and a receiver, comprising a first chamber adapted to be connected to said control, a second chamber adapted to be connected to said receiver, said chambers communicating with each other through a first passage, a normally closed regulating valve member controlling said first passage, said chambers also communicating with each other through a

second passage which is disposed axially in said regulating valve member, a normally open isolating valve member controlling said second passage, and a guiding tail carried by said regulating valve member and slidably engaged in a fluid-tight



manner in a bore connected to said second chamber to the rear of said guiding tail, said isolating valve member being housed in a recess which is integral with said regulating valve member and into which said second passage opens.

3,905,656

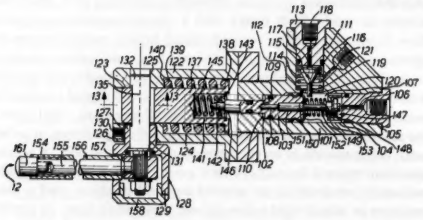
MASTER CYLINDER ASSEMBLIES FOR HYDRAULIC SYSTEMS

Robin Adam Cochrane, Haseley Knob, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 215,848, Jan. 6, 1972, abandoned. This application Aug. 10, 1973, Ser. No. 387,257

Int. Cl. B60t *15/04*

U.S. Cl. 303—50 **3 Claims**



1. A manually-operable brake applying mechanism for vehicles comprising a housing having a bore, a piston working in said bore and movable between an inoperative retracted position and an operative advanced position, resilient means for urging said piston into said inoperative retracted position, said housing also having an inlet port for connection to a source of hydraulic fluid under pressure and an outlet port for connection to brake applying means, valve means for controlling communication between said inlet port and said outlet port and movable between an open position and a closed position, resilient means to urge said valve means into said closed position when said piston is in said inoperative retracted positon, an operative engagement between said piston and said valve means to urge said valve means into said open position when said piston is moved from said inoperative retracted position into said operative advanced position, and mechanical operating means for urging said piston from said inoperative retracted position into said operative advanced position, wherein said mechanical operating means comprises a thrust member for engagement with said piston and having a transverse bore, a transverse shaft projecting through said transverse bore and journalled for rotation in said housing, said shaft having an intermediate portion rotatable within said transverse borer and which is provided with a pair of flats which intersect at a point spaced from a diametrically opposite point on said shaft by a distance less than the diameter of said transverse bore, said thrust member being movable with respect to said housing upon rotation of said transverse shaft between a first position in which the effective diameter of said shaft is at a maximum and a second position in which the effective diameter of said shaft is at a minimum, and an angularly movable applying member for rotating said shaft between said first and second positions.

3,905,657

LUBRICATED VERTICAL THRUST BEARING

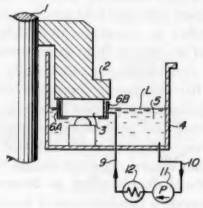
Isao Ishida, Takahagi, and Yutaka Kitano, Hitachi, both of Japan, assignors to Hitachi, Ltd., Hitachi, Japan

Filed Oct. 30, 1973, Ser. No. 411,178

Claims priority, application Japan, Nov. 10, 1972, 47-112114

Int. Cl.² F16C *1/24, 17/06, 33/66, 37/00*

U.S. Cl. 308—73 **5 Claims**



1. A thrust bearing device for use in a vertical shaft rotary machine comprising

a bearing runner rigid with a rotational vertical shaft;

a plurality of bearing pads each having a sector shape in its horizontal cross-section and slidably supporting said bearing runner thereon;

at least one oil overflowing chamber provided for said pads along the radially inner and outer sides of said pads and the side thereof facing the direction of rotation of said bearing runner, said chamber being open to the relative sliding surface of said pads, and

means for feeding a sufficient amount of oil into said at least one oil overflowing chamber to provide an oil film for the relative sliding surface of said bearing pads for lubrication and for maintaining the level of oil overflowed from said oil overflowing chamber lower than the lower faces of said bearing runners.

3,905,658

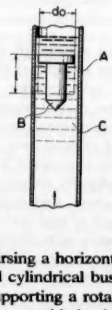
ROTATORY SHAFT FLUID BEARING

Giichi Nakamura, 2,4-chome, Gamocho, Jotoku, Osaka, Japan

Filed Jan. 9, 1974, Ser. No. 431,988

Int. Cl.² F16C *1/24, 7/04, 33/74;* **F16J** *15/34*

U.S. Cl. 308—36.1 **4 Claims**



1. A bearing compirsing a horizontal elongated cylindrical housing, an elongated cylindrical bushing with an inner wall inside said housing supporting a rotating shaft in an inserted relation, packing means provided at both sides of said bushing to seal said bushing and said shaft in a fluid-tight relationship,

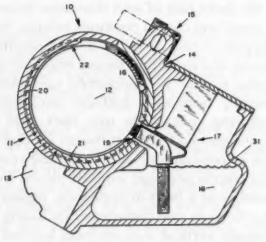
supply conduit means substantially normal to said housing pump means coupled to said supply conduit to drive a fluid from outside into said bushing and to supply a fluid into the lowermost central portion of said bushing with a given head, discharge conduit means to discharge a fluid out of both uppermost side portions of said bushing, the inner diameter of said bushing being substantially larger than the diameter of said shaft so that there is a substantial clearance between said bushing and said shaft to provide a continuous fluid passage all around said shaft within said bushing, whereby a fluid supplied into said bushing by way of said supply conduit means may flow from the lowermost central portion of said bushing to the uppermost side portions of said bushing through said fluid passage all around said shaft continuously upward with a given head and then be discharged out of said bushing by way of said discharge conduit means, thereby supporting said shaft with the upward flowing fluid in a hydrodynamically floating relation within said bushing.

3,905,659

LUBRICATED BEARING

Richard J. Renk, and George E. Boller, both of Winona, Minn., assignors to Gladys D. Miller, Winona, Minn.

Filed Apr. 16, 1973, Ser. No. 351,176
Int. Cl. F16c *1/24, 33/78;* **F16j** *15/34*
U.S. Cl. 308—36.1 **18 Claims**



1. A bearing comprising,
a arcuate bearing surface sized to engage a journal,
a continuous groove in which a rotating member may move during rotation of a journal, and
an internal drain passage extending within said bearing and communicating with said groove to allow a lubricant to be moved away from said groove and into said passage by said member during rotation thereof.

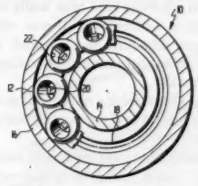
3,905,660

DRILLED BALL BEARING WITH A ONE PIECE ANTI-TIPPING CAGE ASSEMBLY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Arthur S. Irwin, Bemus Point, N.Y.

Filed Mar. 12, 1974, Ser. No. 450,505
Int. Cl.² F16C *33/32*
U.S. Cl. 308—191 **1 Claim**

1. In a drilled ball bearing assembly of the type having a circular cage interposed between inner and outer races for mounting a plurality of drilled balls in spaced relationship for rotation as the inner race revolves relative to the outer race and said races contact said balls, the combination comprising:
a passage extending diametrically through each ball, said passage defining a pair of diametrically opposed openings each having an edge on the outer surface of said ball, and
a pair of oppositely disposed projections adjacent to said openings extending toward each of said drilled balls from the inner surface of said cage, said projections and said cage comprising a one-piece unitary structure formed from the material from which said cage is constructed, each of said projections comprising,
a pair of surfaces projecting from the inner surface of said cage and meeting in an apex to form an edge so that when said drilled ball assumes a given angular orientation the



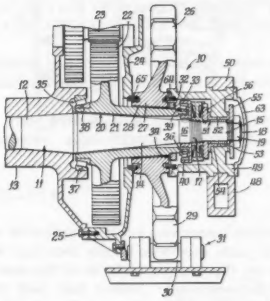
rotation of said edge of each of said openings past the point of contact of said edge with said surface is prevented, and
oppositely disposed end surfaces of each of said projections forming right angles to said edge.

3,905,661

SPRING LOADED BEARING ARRANGEMENT

Robert S. Orr, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 28, 1974, Ser. No. 473,893
Int. Cl.² F16C *25/00*
U.S. Cl. 308—207 A **10 Claims**



1. Bearing structure of the character described comprising:
a bearing for rotatably supporting a rotatable means;
support means including a bearing cage for movably supporting said bearing;
a carrier adjacent said support means;
resilient force transfer means carried by said carrier in engagement with said support means; and
means for positioning said carrier in abutment with said support means to apply a preselected force through said resilient force transfer means to said support means for effectively preloading said bearing and maintaining said preloading notwithstanding subsequent wear of the bearing.

3,905,662

COMBINED CABINET AND TABLE

James W. Richmond, Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed May 28, 1974, Ser. No. 473,412
Int. Cl.² A47B *57/00, 77/14*
U.S. Cl. 312—250 **2 Claims**

1. A table and cabinet assembly, comprising:
similar cabinet halves having coplaner top and bottom walls, each cabinet half having a rear wall, a front wall

and a side wall, the other side of each cabinet half being open, and said cabinet halves being of a height whereby the coplaner top walls can be used as a table top;

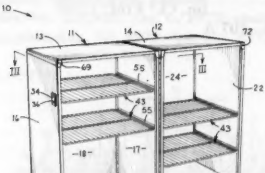
hinge means defining a vertical axis and connecting the adjacent free edges of said rear walls together whereby said cabinet halves can be swingably moved between a closed position wherein said rear walls are coplaner and an open position wherein said rear walls overlie one another and are adjacent and parallel, the corners and outside edges of each cabinet half being rounded internally and externally;

ground engaging wheel means mounted on the bottom walls of said cabinet halves and supporting same for movement thereof;

a plurality of shelf means independently slidably and removably supported within said cabinet halves, said plurality of shelf means being parallel, horizontal and independently movable towards and away from the side wall of the respective cabinet half when the cabinet halves are in said open position;

first latch means having cooperating portions mounted upon said front walls adjacent said free edges thereof for releasably holding said cabinet halves in said closed position;

second latch means having portions thereof mounted upon said side walls of said cabinet halves adjacent the rear walls thereof for holding said cabinet halves in said open position;



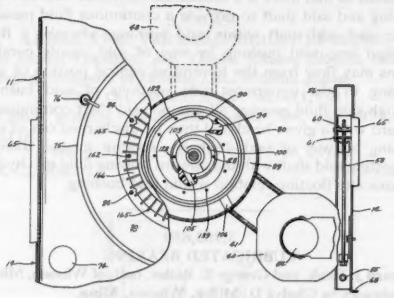
said shelf means comprising a pair of horizontal and parallel elongated guide members fixedly mounted in opposing positions on the interior surfaces of the rear and front walls of the respective cabinet half, said shelf means further comprising a rod-form shelf extending between and slidably supported on the opposed pair of horizontal guide members, said shelf being slidably supported on said guide members for substantially horizontal displacement between a first position wherein the shelf is disposed entirely within the interior of the respective cabinet half and a second position wherein the shelf projects outwardly through the open side of the respective cabinet half;

each said elongated guide member including spaced upper and lower horizontal flanges which extend longitudinally of the guide member and are interconnected by a vertical flange, the upper horizontal flange being fixed to the adjacent cabinet wall and extending between the adjacent wall and the upper edge of the vertical flange, the vertical flange being spaced outwardly away from the surface of the adjacent wall, and the lower horizontal flange being fixed to the vertical flange adjacent the lower edge thereof and projecting horizontally inwardly into the interior of said cabinet half so that said upper and lower horizontal flanges are disposed on opposite sides of said vertical flange, and the rod-form shelf having opposed edge portions which are slidably seated on the lower horizontal flanges so that the shelf is slidably confined between the opposed vertical flanges as formed on the opposed guide members.

3,905,663
CONVERTIBLE DISHWASHER

Richard P. Bergeson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed May 8, 1974, Ser. No. 467,859
Int. Cl.[2] A47B *77/08*
U.S. Cl. 312—253 **7 Claims**



5. A dishwasher optionally convertible between a free-standing appliance and a built-in appliance, the combination comprising: container means defining a washing chamber having an access on a front side thereof; door means hingedly mounted on the front side of said container means and operable between open and closed positions relative to said access; structural support means fixed to and depending from said container means and including means engageable with a generally horizontal surface for supporting said container means on said generally horizontal surface; enclosure means for generally enclosing at least the top, back, and sides of said container means and said support means for operation of said dishwasher as a free-standing appliance and removable from said container means and said support means for installation of said dishwasher as a built-in appliance; means for effecting a washing of articles in said dishwasher including pump means having a generally vertical axis centrally located with respect to said container means and depending from a bottom portion of said container means and further including a drive motor for operating said pump means, said support means including an auxiliary removable base member for mounting said drive motor in a first location on a first axis generally parallel to and rearwardly spaced from the axis of said pump means to produce a first moment of force resulting from the weight of said drive motor for opposing a second moment of force resulting from the weight of said door means and exterior downwardly directed forces acting thereon in said open position when the dishwasher is used as a free-standing appliance; optional means for mounting said drive motor on said support means in a second location on a second axis generally parallel to said first axis and spaced forwardly of said pump axis and adjacent the front side of said dishwasher for accessibility of said drive motor from said front side when the dishwasher is installed as a built-in appliance; and means for drivingly connecting said drive motor to said pump means in said first and second locations.

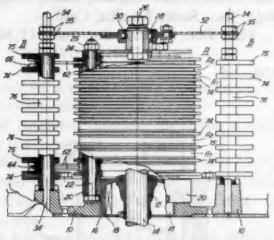
3,905,664
ROTATING CURRENT TAP AND PROCESS FOR OBTAINING SAME

Vittorio Baldoni, Cinisello Balsamo, Milan, Italy

Filed Apr. 15, 1974, Ser. No. 461,013
Claims priority, application Italy, June 28, 1973, 26015/73
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—8 R **16 Claims**

1. Rotating current tap comprising a plurality of contact-rings and corresponding brushes, the single rings of said plurality being inserted between electrically insulating, separating and distancing members clamped to each other in order to

form a number of units having the desired features, each of said contact rings (A1-A2) being centered and torsionally retained with respect to the axis of rotation of the current tap of the present invention by means of at least one elastically yielding member (52) clamped between said separating and distancing members (44-45), said yielding member cooperating by means of at least a part of the periphery thereof with an internal wall (40) of the above mentioned contact ring in such a way that, when contact ring unit (A) formed with the ring and with the corresponding separating-and-distancing members, is clamped, under an appropriate control, said elastic member is deformed in such a way as to lock the contact rings radially and to displace said rings in axial direction with respect to the corresponding brushes, so as to align the various contact rings with the brushes.



16. A method for constructing a rotating current tap having contact rings and brushes comprising the steps of:

a. assembling and clamping brush groups to corresponding insulating and distancing plates to form an axially aligned brush unit;

b. providing contact rings and resiliently yielding members which are inserted between distancing and separation members to form ring pairs, a plurality of said ring pairs being restrained to one another with a tie rod but radially movable within limits to form a ring unit;

c. disposing said ring unit in engagement with said brush unit by restraining said ring unit by a shaft and bearing assembly; and

d. tightening said tie rod to deform and squash said resilient members to thereby align and maintain the radial contact ring positions.

3,905,665

ELECTRICAL CONTACT STRUCTURE AND ASSEMBLY METHOD

James Edward Lynch; Kenneth Ronald Parmer, both of Harrisburg, and Robert Franklin Cobaugh, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 321,076, Jan. 4, 1973, abandoned, and a continuation-in-part of Ser. No. 193,366, Oct. 28, 1971, abandoned, and a continuation of Ser. No. 224,524, Feb. 8, 1972, abandoned, said Ser. No. 321,076, is a continuation of Ser. No. 166,540, July 27, 1971, abandoned, said Ser. No. 224,504, is a continuation-in-part of Ser. No. 166,540, and Ser. No. 193,366. This application Mar. 13, 1973, Ser. No. 340,797

Int. Cl.² H05K *1/07*

U.S. Cl. 339—17 L **7 Claims**

5. In a panel having a substrate provided with metal lined apertures, a plurality of contacts having medial portions mounted in said metal lined apertures and a housing mounted on said substrate and encircling said contacts, the improvement comprising:

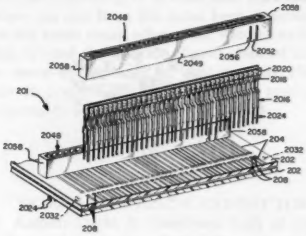
bands of solder on medial portions of said contacts joining said contacts to said metal lined apertures,

sidewall portions on said housing having resilient latching means resiliently and removably latched to selected ones of said contacts,

each contact medial portion having an inverted shoulder and an adjacent elongated section,

said inverted shoulder having solder thereon and being engaged on said substrate against a corresponding metal lined aperture,

said elongated section having said solder thereon and being internally within a corresponding metal lined aperture,



means on each contact in spaced relationship from said substrate for selective latched receipt of said latching means thereon and,

a clearance in a corresponding sidewall portion adjacent to said latching means to allow insertion of a tool therein to unlatch said latching means.

3,905,666

DEVICE FOR THE ELECTRIC CONNECTION BETWEEN A DISPLAY DEVICE OF AN ELECTRONIC TIMEPIECE AND THE CIRCUIT CONTROLLING THE SAID DISPLAY DEVICE

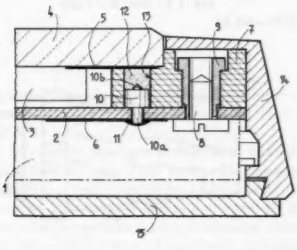
Maurice Grimm, and Maurice Vuilleumier, both of Neuchatel, Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Mar. 4, 1974, Ser. No. 447,983

Claims priority, application Switzerland, Mar. 22, 1973, 4165/73

Int. Cl.² H01R *13/24*

U.S. Cl. 339—17 R **4 Claims**



1. Apparatus for providing an electrical connection between a display device of an electronic timepiece and a circuit controlling the display device, said apparatus comprising:

A. a printed circuit board including a support member therefor,

B. an insulating mounting member comprising a bore,

C. a solid metallic stud carried by the circuit board support member including a pointed protrusion on the axial face of the stud, the stud positioned in the bore,

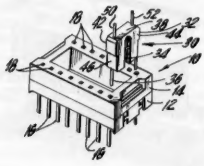
D. a plug of electrically conductive elastomeric material arranged within said bore, and

E. said protrusion of the metallic stud being constructed and adapted to engage said elastomeric plug, whereby good electric contact is assured without significant pressure.

3,905,667
SHORTING PLUG FOR AN INTEGRATING CIRCUIT SOCKET

David J. Crimmins, Stockton, and William Y. Sinclair, Frenchtown, both of N.J., assignors to Aries Electronics, Inc., Frenchtown, N.J.

Filed Apr. 24, 1974, Ser. No. 463,756
Int. Cl.[2] H01R 31/08
U.S. Cl. 339—19 7 Claims

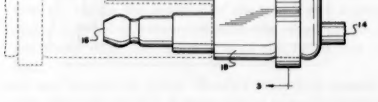


1. A low profile shorting plug for interconnecting two contacts of an integrated circuit socket comprising:
an elongated housing made of an insulated material having an opening extended along the longitudinal axis thereof, which housing includes an upper surface and a lower surface;
a U-shaped metallic pin disposed in the opening of said elongated housing and extending from the lower surface and having its leg portions perpendicular to the longitudinal axis of said housing; and
a pair of spaced insulated storage ears extending from the upper surface of the housing, with the spacing and size of said storage ears being substantially equal to the spacing and size of said leg portions of said U-shaped metallic pin whereby either the leg portions of the U-shaped metallic connecting pin or the storage ears may be inserted into two contacts of an integrated circuit socket.

3,905,668
SEALING BAND FOR ELECTRICAL CONNECTOR

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 1, 1974, Ser. No. 447,455
Int. Cl.[2] H01R 11/28
U.S. Cl. 339—60 M 8 Claims

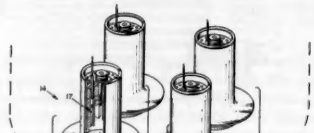


1. An electrical apparatus of the type subjected to an atmosphere of moisture and salt, comprising:
a. first and second circuit elements, said elements including, respectively, first and second pairs of insulated leads having terminal portions;
b. first and second mating electrical connectors attached, respectively, to said first and second pairs of insulated leads, each of said electrical connectors comprising:
i. a wire connector electrically attached to said terminal portions of each of said leads,
ii. an elastomeric insulating body, having a lead end and a connector end, and encasing at least a portion of each of said wire connectors and said terminal portions of said leads, said elastomeric insulating body having a generally oval cross section in its uncompressed state; and
iii. an elongated sealing band compressively formed about substantially the entire periphery of said elastomeric insulating body, adjacent said lead end thereof, said sealing band being formed into a non-circular configuration which exerts a force on said insulating body to compress the portions of said insulating body adjacent said conductors radially toward each of said conductors around a major circumferential portion thereof to minimize the leakage of moisture therebetween.

3,905,669
STRUCTURAL ALIGNMENT PIN AND ELECTRICAL CONNECTOR ASSEMBLY

Larry L. McCormick, Los Angeles, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Dec. 1, 1972, Ser. No. 311,303
Int. Cl. H01r 23/16
U.S. Cl. 339—65 5 Claims

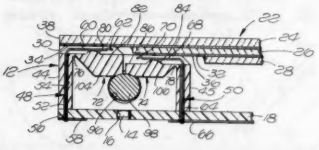


1. A coupling including:
a structural alignment socket,
a structural alignment pin matingly removably insertable in said socket,
said structural pin having a recess extending axially inwardly of a forward end thereof,
an electrical contact pin mounted within said structural pin recess and extending longitudinally therewith,
a sheath means mounted within said structural socket and having a forward end extending longitudinally therewith matingly removably insertable into said structural pin recess, and
an electrical contact socket carried longitudinally within said sheath member and matingly receiving said contact pin, whereby a combined structural alignment and electrical connection is achieved,
said structural pin having a forward axial end in the shape of a hemisphere for easy entry into said structural socket, said structural pin having a plurality of said recesses extending inwardly of said head and symmetrically spaced about the center thereof, at least one said electrical contact pin mounted in each of said recesses, said sheath means having a plurality of said forward ends symmetrically spaced about the axis of said socket and matingly removably insertable within separate said recesses, at least one said electrical socket longitudinally carried within each of said forward ends of said sheath means for matingly receiving said electrical pins.

3,905,670
ACTUATED PRINTED CIRCUIT CONNECTOR

John W. Anhalt, Orange, and James H. Curley, Santa Ana, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,244
Int. Cl.² H01R 13/62
U.S. Cl. 339—75 MP 13 Claims

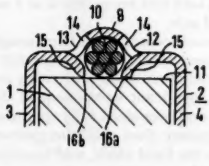


1. A connector for a panel having a plurality of conductive traces thereon comprising:
an elongated insulative housing including a longitudinally extending fixed portion;
a plurality of contacts in said housing each having one end thereof fixed with respect to said fixed housing portion and spaced apart a distance corresponding to the spacing of said traces;
said housing having a plurality of spaced actuating fingers one for each said contact, said actuating fingers each being connected to said fixed housing portion by a relatively thin hinge section, each said actuating finger having a first side and an opposite second side;
the other ends of said contacts lying adjacent to said first side of said actuating fingers;
cam means in said housing positioned on said second side of said actuating fingers, movement of said cam means in a predetermined direction causing said fingers to shift said contacts in a first direction for engagement with said conductive traces when said panel is positioned adjacent to said contacts; and
said other ends of said contacts being stressed to resiliently urge said fingers into engagement with said cam means.

3,905,671
CLAMPING CONNECTOR

Ernst-Friedrich Lechner, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 5, 1974, Ser. No. 448,297
Claims priority, application Germany, Mar. 7, 1973, 2311295
Int. Cl.² H01R 13/24
U.S. Cl. 339—95 R 9 Claims



1. In a clamping connector for making a clamped electrical connection between a rectangular connector pin and a wire type conductor, which clamping connector comprises an approximately U-shaped clamp having two free legs and a bottom and made of an elastic, electrically conductive strip material which can be slipped on to the connector pin and having its free legs bent inwardly in approximately semicircular form and contacting one of the lateral faces of the connector pin, with the bottom protion of the U-shaped clamp adjacent the opposite lateral face of the connector pin having an outward arch in the shape of a dome formed therein to form, with said opposite face, a channel to receive the conductor, after which said clamp may be subjected to a clamping force to affix the conductor in place, wherein the improvement comprises at least two window cutouts, one being made on each side of the domed portion, remote from the ends of the dome, formed by at least two circumferential cuts in the dome, the cuts extending to at least near the dome top, with the window cut out from the done bent downward and inwardly at the lower uncut edge of the window to form prongs protruding toward the interior of said channel and together with the dome-shaped arch at least partially clamping the conductor to prevent the conductor from turning aside or shifting during or after clamping.

3,905,672
SEALED ELECTRICAL CONNECTOR

John W. Anhalt; David S. Goodman, both of Orange, and Edgar Burns, Los Angeles, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,586
Int. Cl.² H01R 13/58
U.S. Cl. 339—103 R 12 Claims

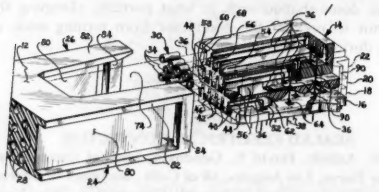
1. An electrical connector member comprising:
an elongated insulator body having a front face and rear face;
a plurality of contact passages in said body extending from said front face to said rear face, said passages being spaced from the outer periphery of said body;
a projection on said body extending rearwardly from said rear face, said projection having a circular cross-section less than the cross-section of said body defining on said rear face a rearwardly facing annular surface;
a plurality of longitudinally extending channels in the outer surface of said projection each aligned with a respective one of said passages;
at least one longitudinally extending groove in the outer surface of said projection;
a boot of elastic pliant material at the rear of said body having a passageway extending therethrough terminating in an enlarged cavity at one end receiving said projection, the wall of said cavity engaging the outer surface of said projection, said boot having a forward edge engaging said annular surface; and
a longitudinally extending rib extending inwardly from said wall of said cavity, said rib slidably engaging with said groove to restrain said boot from rotation to said body.

3,905,673

HEADER BLOCK

Robert F. Evans, Harrisburg, and William L. Unger, Stewartstown, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1972, Ser. No. 314,011
Int. Cl.[2] H01R 13/46
U.S. Cl. 339—192 R 8 Claims



1. A header block including a body having a front face and a rear face, a number of rows of cavities in the body communicating with said faces to form a number of spaced rows of openings in said rear face, a stacked wafer assembly comprising a number of generally flat wafers positioned one on top of the other, the assembly including a face, a plurality of wire paths in said wafer assembly, each wire path including a first part extending from an opening in the assembly face a distance along a meeting surface between adjacent wafers and a second part extending from the end of the first part through a passage extending through the thickness of at least one wafer to an opening formed in the outer surface of a wafer on one side of the assembly, said wire path openings in said assembly face being arranged in a number of spaced rows of openings; said body and assembly including mounting means for securing said assembly to the body with the assembly face adjacent the body rear face and with each row of wire path openings in said assembly face in alignment with a row of openings in said body rear face and with each opening in the body rear face in alignment with a wire path opening in the assembly face; and a plurality of conductors, each conductor including a contact element in a cavity in the body and a wire extending from the contact element through an opening in the body rear face of the body and the aligned wire path opening in the assembly face and along a wire path in the assembly with the free end of the wire located adjacent said wafer outer surface; at least some of said wire path second parts extending through the thickness of at least two wafers.

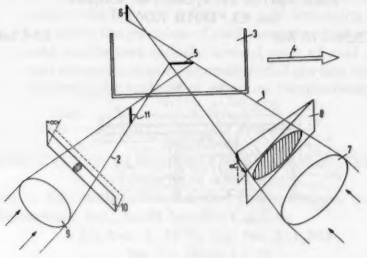
3,905,674

APPARATUS FOR PRODUCING ONE-DIMENSIONAL HOLOGRAMS

Hartwig Ruell, Otterfing, and Eckhard Storck, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 11, 1974, Ser. No. 487,550
Claims priority, application Germany, July 11, 1973, 2335305
Int. Cl.[2] G03H 1/04
U.S. Cl. 350—3.5 3 Claims

1. In an apparatus for sequentially recording extremely narrow, one-dimensional holograms on a moving storage medium, the apparatus including a coherent light source from which an object wave and a source symmetrical reference wave are directed onto the moving storage medium, the improvement comprising a spherical lens and a plane-parallel transparent plate disposed in the path of each of the two beams with the plate being positioned between the storage medium and its respective lens at an angle of inclination to the axis of its respective beam so that each of the beams is focused



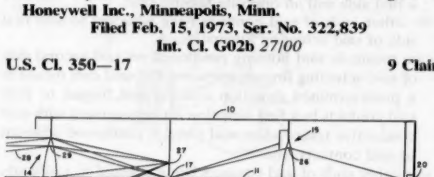
by its lens and the plate spreads the focused beam into a narrow focal line.

3,905,675

OPTICAL SYSTEMS HAVING STOP MEANS FOR PREVENTING PASSAGE OF BOUNDARY WAVE RADIATION

William Lynn McCracken, Wayland, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 15, 1973, Ser. No. 322,839
Int. Cl. G02b 27/00
U.S. Cl. 350—17 9 Claims



1. In an optical instrument having an optical axis to be directed toward an object to be observed, in combination:

objective optics coaxial with said optical axis and focusing at a first image plane along said axis incident electromagnetic radiation aligned therewith, said optics including means inherently acting as a first annular source of boundary wave radiation;

relay optics coaxial with said optical axis and focusing radiation from said first image plane at a second image plane along said axis;

first stop means located at said first image plane and having an over-sized axial aperture to permit passage of on-axis incident radiation while preventing passage of radiation having a significant component of direction normal to said axis, said over-sized axial aperture having a diameter slightly greater than the true geometric field of view imaged in the focal plane, said aperture inherently acting as a second source of boundary wave radiation;

second stop means in said relay optics having an axial aperture sized to effectively reduce the size of the second objective optics to permit passage of said on-axis incident radiation while preventing passage of boundary wave radiation from said second source; and

third stop means located adjacent said second image plane having an axial aperture over sized to prevent passage of boundary wave radiation having a significant component of direction normal to said axis, said over-sized aperture

having a diameter slightly greater than the true geometric field of view imaged in said second image plane.

3,905,676

COUPLING DEVICE FOR OPTICAL WAVEGUIDE

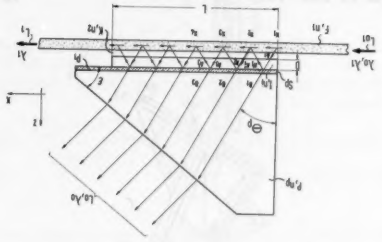
Reinhard Ulrich, Leonberg-Silberberg, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Bursenstrasse, Germany

Filed Oct. 16, 1973, Ser. No. 406,810

Claims priority, application Germany, Nov. 28, 1972, 2258215

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 C **23 Claims**



1. Selective optical coupler for coupling at least one optical beam propagating freely in an optical medium with at least one optical wave propagating and guided in a dielectric film comprising,

an interference layer,

means for nonselectively coupling an optical beam along a coupling interval into or from said dielectric film through one surface of said dielectric film from or into said interference layer said layer selecting at least one optical beam by multiple reflections between its two boundaries, and a partially transparent reflector on one side of said layer through which at least said selected optical beam propagating in said interference layer is coupled with the freely propagating optical beam.

3,905,677

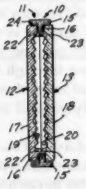
REFLECTIVE DISPLAY DEVICE

Henry Lindner, Woodale, and James D. Kennedy, Streamwood, both of Ill., assignors to Beatrice Foods Company Div. Elgin Molded Plastics, Elgin, Ill.

Filed Feb. 4, 1974, Ser. No. 439,044

Int. Cl.² G02B *5/12*

U.S. Cl. 350—97 **20 Claims**



1. A construction adapted for incorporation into a display device or the like comprising:

A. a closed loop of material which cross-sectionally is generally characterized by having a T-shape in which the top cross bar of the T forms an outside generally vertically extending wall member and in which the leg bar of the T forms an inwardly generally transversely projecting flange member,

B. a pair of plate-like members, each such member having an outside face and an inside face, each inside face having upstanding shoulder portions defined therein in spaced relationship to the perimeter thereof, each such member being adapted to matingly engage over a different opposed lateral side portion of said loop with said perimeter thereof being adjacent inside wall portions of said outside wall member and engaging side wall portions of said projecting flange member, said respective shoulder portions of each such member being adapted to abut against one another when such members are so matingly engaged over such lateral side portions.

3,905,678

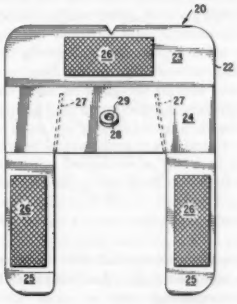
CYCLE REFLECTOR

Richard M. Blasy, 1009 Scott St., Midland, Mich. 48460, and Richard T. McDermott, 5078 Chainbridge Rd., Bloomfield Hills, Mich. 48813

Filed Apr. 24, 1974, Ser. No. 463,608

Int. Cl.² G02B *5/12*

U.S. Cl. 350—97 **15 Claims**



1. A cycle reflector adapted for installation on a cycle having caliper braking means, comprising a first generally flat surface adapted to abut transversely against a cycle fork assembly, at least one pair of lateral support members protruding from said flat surface and being positioned thereon in a manner to lie closely adjacent the lateral edges of said fork assembly, whereby lateral movement or rotation of said reflector is prevented, a second generally flat surface adapted to be in an alignment substantially vertical and substantially normal to the direction of travel of the cycle in its conventional operating position, reflecting means disposed upon said second flat surface and aperture means adapted to permit passage through said reflector of bolt fastening means for a caliper braking assembly.

3,905,679

REFLECTOR PLATE

Erwin Langenbach, Buchholz, Germany, assignor to Erwinsick Optik-elektronik, Waldkirch, Germany

Filed Jan. 10, 1974, Ser. No. 432,189

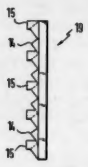
Claims priority, application Germany, Jan. 15, 1973, 2301868

Int. Cl.² G02B *5/12*

U.S. Cl. 350—103 **21 Claims**

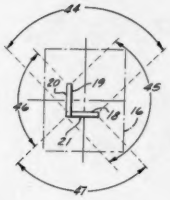
1. Reflector plate of thermoplastic transparent material whose surface facing the reflecting light is planar and whose other surface has triple reflectors uniformly distributed and closely juxtaposed according to a regular pattern wherein the

improvement comprises providing in at least part of the triple reflectors a plurality of feet arranged at spaced points of the



triple pattern and projecting above the tips of the triple reflector thereof.

3,905,680
360° REFLEX REFLECTOR
Robert I. Nagel, Skokie, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Dec. 28, 1973, Ser. No. 429,098
Int. Cl.² G02B 5/12
U.S. Cl. 350—103 **11 Claims**



1. A reflex reflector body adapted to retro-reflect incident light over an included angle of at least about 360° measured in one plane comprising

A. a body having four retro-reflective, generally planar surface portions arranged into two pairs of two portions each, said portions of each such pair of portions being generally in opposed, parallel relationship to each other, one such pair of portions being normally disposed relative to the other thereof, each said portion having at least one region comprised of transparent, solid material and having a region axis normal thereto,

B. support means holding each such pair of portions in fixed, substantially non-overlapping adjacent relationship relative to the other thereof,

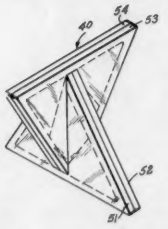
C. each one of said regions having formed therein at least two groups of cube corner reflector elements, all such elements each having a central optical axis, the respective such optical axes of such elements in each such group being disposed substantially parallel to the respective such optical axes of the other such elements in each such group, each one of said regions further being retro-reflective of light directed thereon over an angle extending up to at least about 45° on a pair of opposed sides of said region axis thereof in a first plane extending through said region axis thereof,

D. the respective optical axes of such elements in one such group being generally parallel to said region axis in each said region,

E. the respective optical axes of such elements in a second such group being inclined at a predetermined angle in one direction relative to said region axis in each said region, and the respective optical axes of such elements in a third such group being inclined at a predetermined angle in a different direction relative to said region axis in each said region,

F. the interrelationship between said groups, and said portions, being such that, when said portions are each vertically oriented spatially, incident light rays striking said body anywhere within an included angle of about 360° in a horizontal plane extending horizontally through said body are adapted to be retro-reflected.

3,905,681
180° VIEWABLE REFLECTOR
Robert I. Nagel, Skokie, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Dec. 28, 1973, Ser. No. 429,099
Int. Cl.² G02B 5/12
U.S. Cl. 350—103 **16 Claims**



1. A reflex reflector body adapted to retro-reflect incident light over an included angle of at least about 180° measured in one plane comprising

A. a body having four retro-reflective, generally planar surface portions, each portion having at least one region comprised of transparent solid material and having a region axis normal thereto,

B. two of said portions being generally coplanar and in adjacent relationship one with the other,

C. the remaining two of said portions being generally in opposed, parallel relationship to each other, and upstanding normally between said adjacent portions,

D. each one of said regions having formed therein at least two groups of cube corner reflector elements, all such elements each having a central optical axis, the respective such optical axis of such elements in each such group being disposed substantially parallel to the respective each optical axis of the other such elements in each such group, each one of said regions further being retro-reflective of light directed thereon over an angle extending up to at least about 45° on one side of said region axis, thereof in a first plane through said region axis thereof,

E. the respective optical axes of such elements in one such group being generally parallel to said region axis in each said region,

F. the respective optical axes of such elements in the second such group being inclined at a predetermined angle relative to said region axis in each said region,

G. the relationship between said groups, and said portions, being such that, when said portions are each vertically oriented spatially, incident light rays horizontally striking said body within an included angle of about 180° in a second plane extending horizontally from a lateral outside edge of one of said adjacent portions to a lateral outside edge of the other of said adjacent portions are adapted to be retro-reflected, and

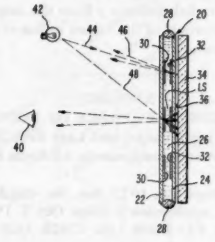
H. interconnecting means mounted each of said portions together fixedly in such relationship.

3,905,682

LIQUID CRYSTAL DEVICES OF IMPROVED CONTRAST

Dietrich Meyerhofer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 14, 1974, Ser. No. 479,529
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC 3 Claims



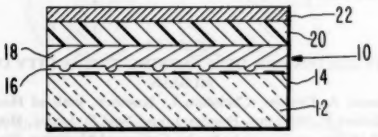
1. In combination, a liquid crystal device including:
a body of liquid crystal material, said device being designed to be viewed along directions intersecting a front surface of said body, and
a retro-reflecting member disposed, with respect to said viewing directions, behind said body and intersected by said directions.

3,905,683

DEFORMABLE MIRROR LIGHT VALVE FOR REAL TIME OPERATION

William Ronald Roach, Rocky Hill, and Lynne Darcy, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 23, 1974, Ser. No. 472,630
Int. Cl.² G02F 01/00
U.S. Cl. 350—161 1 Claim



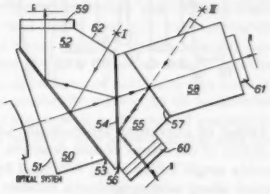
1. A deformable mirror light valve of the type having a transparent substrate, a transparent conductor layer covering one surface of said transparent substrate, a photoconductor layer on said transparent conductor layer, an elastomer layer on said photoconductor layer, and a deformable mirror layer on said elastomer layer, wherein the improvement comprises: said elastomer layer comprising silicone rubber having a resistivity modifier to impart to said layer a resistivity in the range of approximately 10^{10} ohm-cm to 10^{12} ohm-cm whereby a carrier moves through said photoconductor layer and said elastomer layer within real time rates under a constant direct current biasing voltage.

3,905,684

OPTICAL BEAM SPLITTING SYSTEM

Gordon Henry Cook, and John Anthony Fawcett, both of Leicester, England, assignors to The Rank Organisation Limited, London, England

Filed Sept. 19, 1973, Ser. No. 398,706
Claims priority, application United Kingdom, Sept. 19, 1972, 43280/72
Int. Cl.² G02B 27/10; H04N 9/09
U.S. Cl. 350—173 7 Claims



1. In a color-separating prism assembly having a plurality of prisms comprising a first prism for receiving an image-forming beam of incident light, a second prism, a first dichroic layer contained between the first and second prisms for reflecting one color component of the image-forming light beam, a third prism, and a second dichroic layer contained between the second and third prisms for reflecting a color component of that part of the image-forming light beam transmitted through the first dichroic layer, at least one further color component of the image-forming light beam being transmitted through the second dichroic layer, the prisms being arranged to provide at least three separated image-forming exit beams corresponding to the respective color components, and said assembly comprising means for providing bias illumination along the axes of at least all but one of the exit beams; the improvement according to which the means for providing bias illumination comprises a plurality of bias light sources, a first plane bias light entry surface formed on the third prism of the prism assembly, through which bias light from a first bias light source enters the prism assembly along an optical axis normal to said first plane surface, said optical axis intersecting the second dichroic layer at an angle which is equal and opposite to the angle between said dichroic layer and the axis of the image-forming light beam, a second plane bias light entry surface formed on one of the first and second prisms of the prism assembly, through which bias light from a second bias light source enters the prism assembly along an optical axis normal to said second plane surface, the bias light from said second bias light source being incident on the first dichroic layer, and means restricting the bias light from the first bias light source to emerge from the prism assembly along less than all the axes of the respective color component exit beams, whereby the levels of bias illumination along the respective exit beam axes can be relatively adjusted.

3,905,685

ZOOM LENS FOR FIXED CONJUGATES

David C. Harper, Claremont; George L. McCrobie, Upland, both of Calif.; Edgar E. Price, and Joachim A. Ritter, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

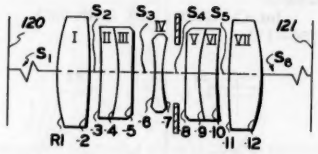
Continuation of Ser. No. 297,096, Oct. 12, 1972, abandoned.
This application Feb. 13, 1974, Ser. No. 442,558
Int. Cl.² G02B 15/14
U.S. Cl. 350—184 5 Claims

1. A variofocal lens system including, in optical alignment along an optical axis:
a central lens,
a pair of doublets, one on each side of said central lens,
said doublets including an inner lens element having a first refractive index and a first dispersion and an outer lens

element having a second refractive index and a second lower dispersion,

a pair of movable single lenses, one on the outward side of each of said doublets,

said movable single lenses being of the same material as the adjacent outward element of said doublets and having an



inner radius of curvature substantially identical to the outer radius of curvature of said doublets,

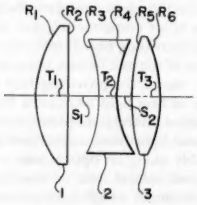
said movable single lenses being arranged for symmetrical movement along said optical axis relative to their adjacent doublets while the entire system is moved relative to the object to vary the focal length of said lens system.

3,905,686

THREE ELEMENT PROJECTION LENS

Paul Lewis Ruben, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,238
Int. Cl.² G02B *3/04, 9/16*
U.S. Cl. 350—189 **2 Claims**



1. A three element lens comprising a front positive element, a middle negative element and a rear positive element, said middle element having two aspheric surfaces and wherein said lens has a focal length of 30.00mm when constructed according to the following parameters:

Element	N_D	V	Radius mm	Thickness or Separation mm
1	1.49168	57.4	$R_1 = 17.819$	$T_1 = 5.085$
			$R_2 = -65.691$	$S_1 = 3.583$
2	1.56735	34.9	R_3 = Asphere	$T_2 = 1.500$
			R_4 = Asphere	$S_2 = 1.315$
3	1.61700	54.9	$R_5 = 19.701$	$T_3 = 5.856$
			$R_6 = -14.316$	

wherein, from front to rear, the elements are numbered from 1 to 3, the corresponding indices of refraction, N, and Abbé numbers, V, are listed for each element, the radii of curvature of the surfaces are numbered from R_1 to R_6, the thicknesses of the elements are numbered from T_1 to T_3, the spacings between the elements are numbered from S_1 to S_2, and wherein R_3 and R_4 represent the vertex radius of curvature of an aspheric surface defined by the following formula and parameters:

$$x = \frac{Cy^2}{1+\sqrt{1-(1+K)C^2y^2}} + Dy^4 + Ey^6 + Fy^8$$

Surface	C	K	D	E	F
3	−.07232879	−.00329635	.00015545	−.00000270	.00000002
4	.06792195	.30882718	.00019064	−.00000326	.00000001

wherein x is the sag of an aspheric surface from a plane reference surface at a radial distance y from the axis of the lens, C is equal to the reciprocal of the vertex radius of curvature and K is the conic constant.

3,905,687

REARVIEW MIRROR CAPABLE OF BEING DIMMED

Per Goran Holmqvist, Vaxjo, and Lars Erik Bertil Eliasson, Braas, both of Sweden, assignors to AB Braas Spegelindustri, Braas, Sweden

Filed Sept. 25, 1973, Ser. No. 400,551
Claims priority, application Sweden, Oct. 2, 1972, 12684/72
Int. Cl.² B60R *1/04;* **G02B** *5/08*
U.S. Cl. 350—281 **2 Claims**

1. In a mirror capable of being dimmed intended for use as a rearview mirror for vehicles in which glass is coated with a plastics layer of approximately the same refractive index, the improvement which comprises a transparent plate-shaped body made of glass, the two opposite faces of which make a small angle with one another and one first face of which is covered with a mirror coating, the second face of the body which is directed away from the mirror coating is covered by a thin layer of transparent plastics, said second face facing the driver, said second face has irregularities with which the plastics material of the plastics layer engages so as to fix said plastics layer to the glass body, the face of the glass body having the irregularities being a roughly ground surface the surface of the plastics layer facing the driver being planar and having a surface finish sufficient to provide high reflectivity for the mirror.

3,905,688

APPARATUS FOR DETERMINING THE ACUITY OF A HUMAN

Thomas A. Decker; Christian L. Kuether, both of Houston; Robert E. Williams, Pearland, and Noel D. Logar, Houston, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Sept. 24, 1973, Ser. No. 400,410
Int. Cl.² A61B *3/02*
U.S. Cl. 351—30 **2 Claims**

1. A self-contained, portable self-controlling device for determining the acuity capability of the visual system of a human subject comprising,

a housing,

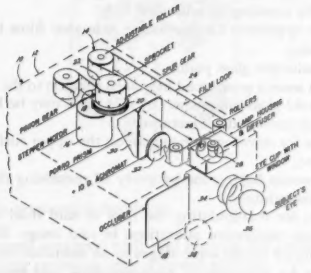
an eye window in the housing in which the subject being tested looks,

a plurality of visual acuity targets positioned in the housing including a plurality of targets at each of a plurality of acuity levels,

an optical display system in said housing presenting a virtual image of one of the targets at optical infinity through the eye window,

a set of switches adapted to be actuated by the subject being tested to indicate his response to the target presented through the window,

control means electrically connected to the switches and said optical display system, said control means controlling the presentation of targets in response to the switch actuated by the subject being tested by presenting a larger subsequent target each time the subject incorrectly identifies the preceding target, and presenting a smaller subsequent target each time the subject correctly identifies the preceding target, and



said control means includes means for determining the level of acuity of the subject, said determining means includes means for counting the number of times that the subject was tested at each particular level of acuity, and displaying that level at which a predetermined count is first reached, regardless of the correctness or incorrectness of each individual response.

3,905,689

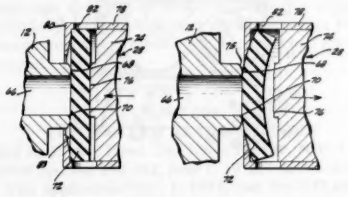
DIRECT OPERATING VALVE

Gerald D. Mylander, 1232 W. Collins, Orange, Calif. 92667

Filed Feb. 28, 1974, Ser. No. 446,607

Int. Cl.[2] F16K *31/06*

U.S. Cl. 251—77 **2 Claims**



1. A directly operating solenoid valve comprising:

a valve having a body, an armature movably mounted within said body from a first position to a second position, a solenoid coil around said body for magnetically urging said armature from its first position toward its second position, a seat within said body having an orifice therethrough for the passage of fluid, the improvement comprising:

a valve disc of resilient material within said body for movement with respect to said seat, said valve disc having a sealing surface for sealing with respect to said seat when said armature is in its first position, said valve disc being substantially circular, a cap having an inwardly directed circular cap flange having a conically beveled inner face directed toward said disc to permit deflection of said resilient valve disc, said cap being secured on said armature so that, as said armature moves from its first position where said disc is on said seat toward its second position, said cap urges the edges of said disc toward said second position, said armature having a head thereon directed toward said seat, a boss on said head facing said seat, said boss being positioned inwardly from said cap flange so that the center of said valve disc normally lies against said boss and said valve disc is unsupported on the side opposite said cap flange so that, as said armature moves, said edges of said valve disc toward its second position and fluid pressure toward said seat holds the center of said resilient valve disc in said seat so that the center of said disc leaves said boss and the outer edges of said valve disc turn into the space beside said boss to leave free said edges of said valve disc with resilient bending of said valve disc being limited by said conically beveled inner face of said inwardly directed circular cap flange and so that, upon separation of said valve disc from its seat, said valve disc resiliently returns to its undeflected position when said armature is in the second position to maximize flow area between said valve disc and said valve seat.

3,905,690

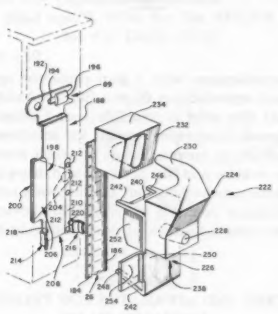
FILM GUIDED PLAYBACK AND RECORDING MECHANISM

Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 28, 1973, Ser. No. 374,502

Int. Cl. G03b *31/02*

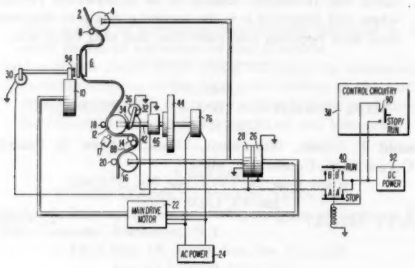
U.S. Cl. 352—27 **27 Claims**



1. A film-laden cassette receivable by and for use in conjunction with a magnetic recording and playback mechanism of the type disposed within motion picture apparatus and having transducer means movable between an idle position and an operative position in engagement with said film when said cassette is received by said apparatus; said film being movable within said cassette in a general path whilst deviating from such path and having a photographic emulsion on one face thereof, a magnetic sound track on the opposite face thereof, and adapted to receive a photographic processing composition on its emulsion bearing face; means mounted in said cassette for applying processing composition to said emulsion bearing face of said film; support means located in said cassette; resilient means mounting said support means in said cassette for restrained movement relative to said cassette for supporting said film and urging same into engagement with said transducer means when said transducer means is in said operative position; said support means being movable within said cassette to follow changes in the path of said film and cooperate with said transducer means to maintain a predetermined registration between said magnetic sound track and said transducer means; spaced guide means mounted on said support means for engaging the opposite edges of said film to cause said support means to follow said film; said support means comprising spaced film engaging means for engaging opposed edge portions of said emulsion bearing face of said

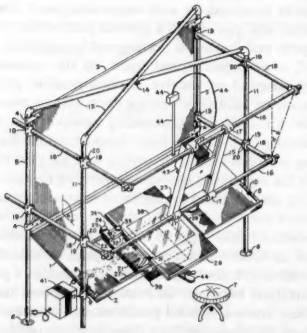
film strip and means forming a channel between said film engaging means to allow the passage of processing composition on a central region of the film without interference; and means mounted in said cassette for applying processing composition to said emulsion bearing face of said film.

3,905,691
FILM PROJECTOR APPARATUS
Bjorn Fritjof Floden, Palmyra, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,428
Int. Cl.[2] G03B *31/02*
U.S. Cl. 352—29 **8 Claims**



1. The combination with a film projector apparatus for instant sound reproduciton from a film, including means to advance said film over a rotatable sound drum to provide rotation thereof, comprising: means for selectively disabling said film advancing means, means to arrest rotation of said sound drum to keep said film between said drum and said film advance means substantially taut, continuously rotatable drive means, and means operable when said film advancing means is enabled to couple said sound drum with said drive means.

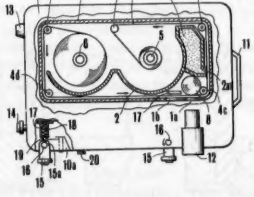
3,905,692
PROCESS AND APPARATUS FOR PRODUCING ANIMATED FILMS
Kelly Hart, 8363 Trenton Rd., Forestville, Calif. 95436
Filed Feb. 12, 1973, Ser. No. 331,956
Int. Cl.[2] G03B *21/32*
U.S. Cl. 352—52 **10 Claims**



1. A process for producing animated films by drawing comprising the steps:
directing a source of heat to the under surface of a translucent glass plate thereby heating said plate to a predetermined temperature;
drawing an image upon the upper surface of said plate by means of a medium which remains fluid at said temperature;
manipulating the flow of said fluid medium to create successive alterations in said image so as to effect a series of consecutive stages in an animated sequence;
successively photographing said image initially and during said subsequent consecutive stages;
thereby creating an animated film.

4. An apparatus for producing animated films by drawing comprising:
a translucent glass plate;
a heat source positioned in spaced relation to the under side of said glass plate whereby said plate may be heated to a predetermined temperature;
means for drawing an image upon the upper surface of said plate,
said means having the property of remaining fluid at said temperature;
means for manipulating the flow of said fluid medium to create successive alterations in said image and effect a series of consecutive stages in an animated sequence;
means for successively photographing said image initially and during said consecutive stages.

3,905,693
PROJECTOR SUITABLE FOR FILM CARTRIDGE HAVING SELF-DEVELOPING MEANS
Inao Moriyama, Ebina; Takashi Itani, and Kiyoshi Takahashi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1974, Ser. No. 474,162
Claims priority, application Japan, May 31, 1973, 48-61682
Int. Cl. G03c *11/00*
U.S. Cl. 352—130 **20 Claims**

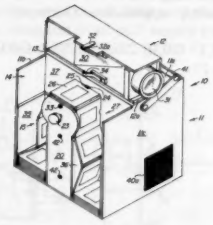


1. A projector suitable for a film cartridge in which developer leaks by its gravity from a developer leakage opening of a developer storing means so as to develop the film, which comprises
means for varying the opening direction of the developer leakage opening, which varies the attitude and position of the film cartridge to a first position where the developer leaks by its gravity from the opening and to a second position where the developer is prevented from leaking from the opening,
driving means for causing actuation of the projector and
film feeding means which causes the film to run upon receipt of driving power from the driving means, and winds back the film to effect the film development when the film cartridge is positioned at the first position by the opening direction varying means.

3,905,694
SLIDE PROJECTOR AND FEED ARRANGEMENT THEREFOR

Vito Miragliotta, 1184 S. 1000 E., Clearfield, Utah 84015

Filed Mar. 4, 1974, Ser. No. 442,318
Int. Cl.[2] G03B *23/08*, *23/12*
U.S. Cl. 353—108 5 Claims



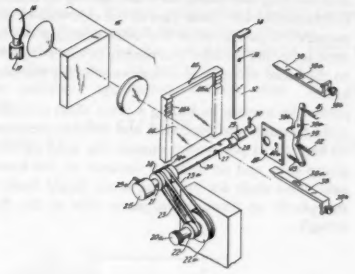
1. A slide projector comprising:
a housing;
a lens means arranged with said housing for focusing and projecting an image onto a screen surface;
a source of electrical energy;
a light source arranged within said housing, passing light therefrom, when energized by said source of electrical energy, into said lens means;
a cage slide mount feed mechanism having sides and arranged to be manually rotated in said housing, providing an unobstructed light passage therethrough when a side thereof is disposed between said light source and said lens means forming a viewing area, light from said light source passing therethrough and thence into said lens means;
a train of slide mounts, each mount arranged to receive a slide therein, connected in end to end relationship so as to fold back and forth over one another into a stack when lowered vertically onto a flat surface; said mounts having their connected edges camfered on opposite faces thereof, and are connected one to another such that a "V" is formed at each connection with adjacent "V's" facing opposite to each other; and
tracking lug means extending outwardly from each side of said cage slide mount feed mechanism for engaging sequentially each slide mount thereby moving said slide mount into and over the viewing area when said cage is rotated.

3,905,695
CONTROLLED READING DEVICE

Stanford E. Taylor, Hawk Dr., Lloyd Harbor, N.Y. 11743

Division of Ser. No. 258,162, June 1, 1972, Pat. No. 3,757,432.
This application Mar. 1, 1973, Ser. No. 337,151
Int. Cl.[2] G03B *23/00*, *23/08*
U.S. Cl. 353—111 4 Claims

1. A reversible slide stick for use with a film projector of the type having a gravity feed for the slide stick and having a pawl mechanism in the projector for releasing the film strip for gravity feed so as to project successive lines of visual material on the film strip, said slide stick comprising:
an elongated member having successive lines of visual material displayed thereon for projection through said projector and a pair of spaced rows or ratchet teeth extending lengthwise of said member with each row being adjacent a longitudinal edge of the member and being in synchronized relationship with respect to lines of visual material and for releasable engagement by the pawl mechanism of the projector; and
the teeth extending out of the plane of the member containing the visual material displayed thereon and one row pointing downward to form a shoulder in one direction for engagement with the pawl mechanism and to permit free movement in the other direction and the other row of teeth pointing downward in the opposite direction to

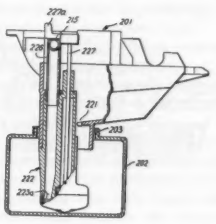


the first row of teeth to thereby permit reversibility of the member in use with the projector.

3,905,696
TONER SYSTEM FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE AND A COPYING MACHINE UTILIZING THIS TONER SYSTEM

Karl Gustav Zeuthen, Gentofte, Denmark, assignor to Zeuthen & Aagaard A/S, Copenhagen, Denmark

Filed Apr. 9, 1974, Ser. No. 459,374
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 6 Claims



1. A toner system for developing a latent electrostatic image on a copy sheet in an electrophotographic copying machine, comprising
a separate closed store receptacle for toner liquid and having bottom and side walls as well as a top wall, in which a single opening is formed for outlet and inlet of toner liquid;
a developing trough adapted to be secured in a horizontal position in the copying machine to receive copy sheets to be developed, said trough having downwardly extending connecting means incorporating a single pipe stub formed integrally with the trough outside one end wall thereof and a tubular member fitted in said pipe stub and extending downwardly therefrom to reach into the interior of the store receptacle through said single opening when the store receptacle is positioned below the trough so as to detachably connect the store receptacle with the trough, separate forward and return flow passages extending inside said pipe stub and tubular member and communicating with the interior of said store receptacle and with said trough for feeding toner liquid from the store receptacle to the trough and returning toner liquid by gravity from the bottom of the trough into the container, said forward flow passage being defined by a pump tube extending right through the tubular member and throughout the length of the trough at the top thereof for distributing

toner liquid across the width of a copy sheet entering the trough and having an inlet opening positioned at the lower end of the tubular member, said return flow passage being formed by the interior of the tubular member surrounding said pump tube and having an outlet opening positioned in the lower part of the side wall of the tubular member separate from the inlet opening of said pump tube to secure an effective mixing of toner liquid returned to the store receptacle before reentering the pump tube; and

a pump mechanism including a drive shaft extending vertically through said pipe stub and tubular member to have its lower end positioned outside the inlet opening of the pump tube and an impeller secured on the lower end of said drive shaft for pumping toner liquid from the store receptacle up through the pump tube to the developing trough.

3,905,697
DUPLEX COPYING APPARATUS

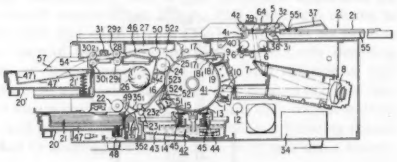
Shigehiro Komori, Yokohama; Yoshitomo Goshima, Kawasaki; Hajime Katayama, and Koichi Miyamoto, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1973, Ser. No. 405,005

Claims priority, application Japan, Oct. 17, 1972, 47-103752

Int. Cl.² G03B *27/32, 27/52*

U.S. Cl. 355—26 **3 Claims**



1. A duplex copying machine adapted to produce images of an original on both sides of a copy paper comprising a housing, an original holder, an exposure slit, optical means for exposing a photosensitive member to an original image through said slit, copying processing means for forming said original image on one side of said copy paper, driving means for driving said copying processing means, a first copy paper cassette detachably mounted at a copy paper feeding station and accommodating copy papers to be fed to said copying processing means, said first copy paper cassette being also detachably mountable at a copy paper discharging station, and a second copy paper cassette detachably mounted at said copy paper discharging station for receiving copy paper upside down, relative to the copy paper in said first copy paper cassette, after completion of a first copying process on one side thereof, said second copy paper cassette being also detachably mountable at said copy paper feeding station, wherein each of said first and second copy paper cassettes includes a movable side plate member which is movable to widen the inlet for receiving copy papers when mounted at said copy paper discharging station and which is movable to press the copy papers at a predetermined position when mounted at said copy paper feeding station, whereby after said copy paper is received in said second cassette the positions of said first and second copy paper cassettes are reversed and another copying process is conducted to thereby obtain a copy paper having original images on both sides.

3,905,698
PHOTOPRINTING APPARATUS IN WHICH DEVELOPER IS REPLENISHED IN PROPORTION TO THE TREATED SURFACE AREA

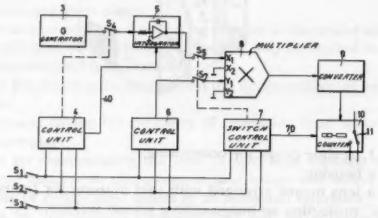
Herbert Schroter, and Werner Dennhardt, both of Taunusstein, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Aug. 22, 1974, Ser. No. 499,645

Claims priority, application Germany, Aug. 25, 1973, 2343067

Int. Cl.² G03B *27/32, 27/52;* **G03D** *13/00*

U.S. Cl. 355—27 **9 Claims**



1. Photoprinting apparatus comprising

an exposure station,

means for selectively feeding one of at least two photoprinting papers of different widths to said exposure station,

a developing station for developing the exposed photoprinting paper,

means for scanning the photoprinting paper to produce a first electrical signal upon detection of the leading edge and a second electrical signal upon detection of the trailing edge of the photoprinting paper,

switching means for detecting the width of the respective photoprinting paper selected and producing an electrical signal indicating that width, and

means for replenishing developer material in proportion to the surface area of the paper treated, including an electric pulse generator connected to said scanning means for receiving said first and second signals and producing a number of electric pulses that number being a function of the length of the photoprinting paper, a control circuit connected to said switching elements and to said pulse generator for adjusting the proportionality between the length of the severed photoprinting paper and the number of pulses to a value which is proportional to the width, as a function of the signals produced by said switching elements and counter means for counting the pulses produced by said pulse generator and, as soon as a predetermined value is reached, actuating said developer replenishing system to add a defined quantity of developer and reset said counter means.

3,905,699
METHOD OF AND APPARATUS FOR MULTI-GALLEY COMPOSITION

Francis S. Szabo, Morristown, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 25, 1974, Ser. No. 482,849

Int. Cl.² G03B *27/52*

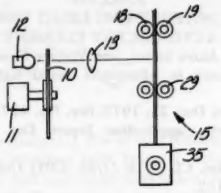
U.S. Cl. 355—41 **7 Claims**

1. A method of multi-column composition, comprising the steps of:

providing a means for detecting a reference feature of a paper sheet advancing along a path and for producing a control signal from such reference feature when detected;

providing a power-driven paper feed means for advancing a photosensitive sheet along said path;

advancing a sheet along said path until the reference feature thereof is detected by said means, and a control signal is generated;
applying said signal to stop said power-driven paper feed means;
composing characters to produce at least one character in a first column position;
thereafter reversing said paper feed to withdraw the paper to a position retracted from said means for detecting the desired reference feature; and



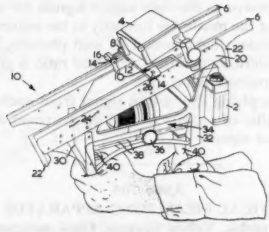
re-advancing said sheet until another control signal is produced by said means for detecting the reference feature, and;
finally, composing a second at least one character on the same page in a lateral position to the first character and in a predetermined relationship thereto by a relationship to said reference feature;
whereby a multiple column galley is obtained in registration from a common reference.

3,905,700

CLOSE-UP PHOTOGRAPHY SYSTEM

George L. Christie, 2250 D Halifax Dr., Ottawa, Ontario, Canada (K1G 2W6)

Filed Jan. 2, 1974, Ser. No. 430,263
Claims priority, application Canada, Jan. 16, 1973, 161356
Int. Cl. G03b *27/54*
U.S. Cl. 355—67 **3 Claims**



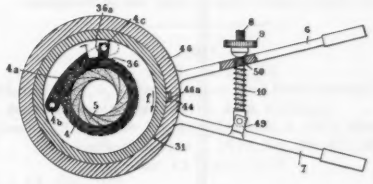
1. An apparatus for taking close-up high magnification photographic exposures of a subject with a camera having a photographic film, a focusable lens, a variable aperture mechanism and an artificial light source; said apparatus comprising a frame having a base member for mounting said camera thereon; support members extending upwardly from the base member and rail means on the support members and angled with respect to the base member; means for mounting an artificial light source moveably on the said rail means; means for locating the position of said mounting means along the length of the said rail means; and a rotatable, interchangeable cylindrical member removably secured to the frame and associated with the rail means and displaying a plurality of index marks at which said location means can be selectively aligned; the index marks displayed on the cylindrical member representing different aperture settings equivalent to the changes in distance between the light source and the subject to provide the required intensity of illumination.

3,905,701

METHOD AND DEVICE FOR ADJUSTING CONTRAST IN PHOTOGRAPHIC AND PHOTOMECHANICAL REPRODUCTION WORK

Michel David, Sceaux, France, assignor to Logabax Anoiennement Ateliers Bariquand & Marre, Paris, France

Continuation-in-part of Ser. No. 246,534, April 24, 1972. This application Nov. 20, 1973, Ser. No. 417,514
Claims priority, application France, Apr. 23, 1971, 71.14563
Int. Cl.² G03B *27/78*
U.S. Cl. 355—71 **5 Claims**



1. Method of photographically reproducing an object, which comprises the following successive steps:
a. forming a luminous reproduction beam propagating from the object in a predetermined direction;
b. concentrating said light beam onto a plane surface disposed across said predetermined direction so as to form an image of said object thereon;
c. stopping the propagation of said light beam outside a first closed contour disposed across said predetermined direction, and encompassing a first predetermined area;
d. diffusing the portion of said light beam which passes between said first closed contour and a second closed contour disposed internally of the first one and encompassing a second predetermined area;
e. varying simultaneously and in the same direction said first and second coutour areas respectively;
f. measuring the illumination of the light areas of said object image;
g. varying only said first contour area;
h. measuring the illumination of the shade areas of said object image;
i. repeating steps (e) to (h) until the illuminations measured in the light and shade areas of the image have predetermined values.
j. photographing the image of said object.

2. Photographic reproduction installation comprising a reproduction apparatus equipped with a lens assembly, comprising a mount and, in said mount, at least one projection lens, a first variable-aperture diaphragm of opaque material and a second variable-aperture diaphragm of translucent material, said first and second diaphragms being disposed tandemwise in said mount in the optical field of said lens, and first and second means disposed on said mount for adjusting from the exterior the apertures of said first and second diaphragms, respectively, first and second photometers, disposed in one light area and one shade area of the image of the object to be reproduced, respectively, first and second power members for actuating said first and second means for adjusting the lens assembly diaphragm apertures, and first and second hand switchable electric means for selectively energizing said first and second power members, respectively.

3,905,702
OIL CONDITION INDICATOR

Charles A. Johnson, P.O. Box 179, Lemmon, S. Dak. 57638

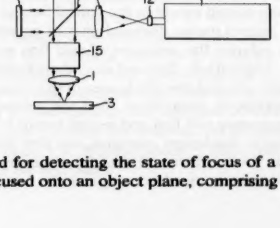
Filed Feb. 15, 1974, Ser. No. 442,798
Int. Cl.[2] G01N *33/28*
U.S. Cl. 356—70 17 Claims

1. A device for quickly determining the need for replacement of engine lubricating oil comprising: a base element defining an upper edge, a front face, and a recess in said front face extending downwardly from said upper edge and having a downwardly decreasing depth, said recess being defined by said edges, at least one of said edges being undercut; a transparent cover overlying said recess; means defining a vent to said recess at a lower portion thereof whereby engine lubricating oil deposited into the upper end of the recess may flow readily downwardly through said recess and undercut edge, said vent comprising a capillary opening preventing leakage of the lubricating oil outwardly therethrough while permitting free venting of the recess for facilitated flow of the oil downwardly therethrough; and indicium means at the rear of said recess, the viewability of which is a function of the opacity of the oil in the recess for indicating the need of replacement of the engine oil as whenever such oil opacity prevents the viewing of the indicium.

3,905,703
METHOD FOR ADJUSTING AN OPTICAL SYSTEM IN AN APPARATUS FOR RECORDING SIGNAL LIGHT BEAMS ON A PHOTOSENSITIVE BODY

Kazuya Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,761
Claims priority, application Japan, June 30, 1972, 47-65741
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—106 R 21 Claims

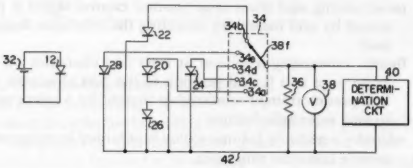


1. A method for detecting the state of focus of a coherent light beam focused onto an object plane, comprising the steps of focusing a coherent light beam on the object plane by using a focusing optical system, directing a wave front reflected from the object plane back through the focusing optical system to an interference surface, directing a reference wave front coherent and coincident with said wave front to said interference surface to form an interference fringe pattern on the interference surface, and detecting the pattern of the interference fringes and the state of focus of the coherent beam focused onto the object plane.

3,905,704
DEVICE FOR DETERMINING LIGHT DIRECTIVITY OF LUMINESCENT ELEMENT

Kotaro Mitsui; Akira Ishizu, and Wataru Susaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 21, 1973, Ser. No. 427,332
Claims priority, application Japan, Dec. 27, 1972, 47-2651[U]
Int. Cl. G01b *11/26*; G01j *1/00*
U.S. Cl. 356—152 7 Claims



1. Apparatus for determining the spatial directivity of light emitted from a luminescent element, comprising:

a plurality of light sensors each having a light responsive area and disposed with the centers of their respective light responsive areas on a single circle, each sensor of said plurality of sensors developing a signal representative of the intensity of light incident on its light responsive area;

means responsive to the light sensor signals for calculating the ratio of the maximum intensity to the minimum intensity of incident light sensed by said plurality of sensors and for determining if the calculated ratio is greater than a predetermined value; and

means for applying the output signal from each sensor of said plurality of sensors to said means responsive to the light sensor signals.

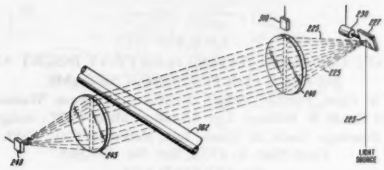
3,905,705
OPTICAL MEASURING APPARATUS

Harry G. Petrohilos, Yellow Springs, Ohio, assignor to Techmet Company, Dayton, Ohio

Continuation-in-part of Ser. No. 222,032, Jan. 31, 1972, Pat. No. 3,765,774. This application Oct. 10, 1973, Ser. No. 404,929. The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.
Int. Cl.[2] G01B *11/04*, *11/10*
U.S. Cl. 356—160 4 Claims

1. In apparatus for optically measuring a dimension relative to an object and including a laser effective to produce a narrow light beam, a reflector member having a reflecting surface positioned within the path of the light beam, means for rotating said reflector member at a constant speed on a fixed axis to produce a rotary scanning light beam within a scanning plane, means for converting the rotary scanning light beam into a planar parallel scanning light beam and having a focal point, means for sensing the parallel scanning light beam and for producing electrical signals in response to interruptions of the light beam by an object positioned within the path of the parallel scanning light beam, means for producing pulses at a

constant frequency, means for counting the pulses, and means for controlling said counting means in response to the operation of said sensing means to provide for counting the pulses between predetermined electrical signals, the improvement wherein substantially all of the light from said light beam engages said reflecting surface of said reflector member at substantially a fixed reflecting point, said reflecting point is



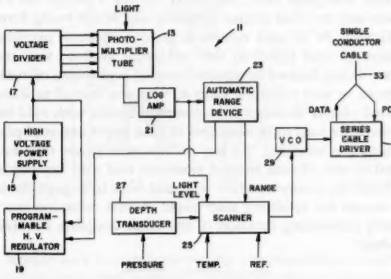
disposed on the rotational axis of said reflector member causing said rotary scanning light beam to originate from said reflecting point, and said rotary axis of said reflector member extends perpendicular to the plane of said parallel scanning light beam and through the focal point of said means for converting said rotary scanning light beam into a said parallel scanning light beam.

3,905,706

LIGHT RESPONSIVE BATHYIRRADIOMETER

Lowell Raymond Pearl, and Roderick S. Mesecar, both of Corvallis, Oreg., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,380
Int. Cl.[2] G01J *1/42*
U.S. Cl. 356—224 **2 Claims**



1. A bathyirradiometer comprising:

a. a photomultiplier tube;

b. voltage supply means operatively connected to the dynodes of said photomultiplier tube for applying dynode voltage to the dynodes of said photomultiplier tube;

c. the output of said photomultiplier tube being operatively connected to the signal of a first amplifier;

d. the output of said first amplifier being operatively connected to the input of an automatic range device;

e. one output of said automatic range device operatively connected to said voltage supply means;

f. said automatic range device controls said voltage supply means to apply predetermined discrete dynode voltages in response to predetermined discrete voltage ranges from said first amplifier;

g. said automatic range device controls said voltage supply means such that said predetermined discrete dynode voltage is maximum when said predetermined discrete voltage range of said first amplifier is minimum and said predetermined discrete dynode voltage is minimum when said predetermined discrete voltage range of the first amplifier is maximum;

h. said automatic range device includes second and third amplifiers, a pulse generator and a range selector;

i. the output of said first amplifier being operatively connected to the input of said second amplifier and to the input of said third amplifier, said second amplifier and said third amplifier are connected to act as comparators, comparing the output of the said first amplifier with an adjustable, predetermined voltage level;

j. the output of said second amplifier being operably connected to a first input of said discrete range selector;

k. the output of said third amplifier being operably connected to the input of said pulse generator, the output of which is operably connected to a second input of said discrete range selector; and

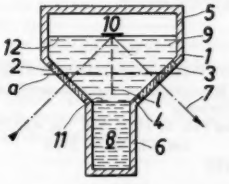
l. the output of said discrete range selector being operably connected to the input of said voltage supply means.

3,905,707

OPTICAL LEVEL

Wieland Feist, 6, Erfurter-Strasse, and Hans-Joachim Stachel, 46, Hausbergstrasse, both of, Jena, Germany

Continuation of Ser. No. 243,516, May 1, 1972, abandoned. This application June 7, 1974, Ser. No. 477,247
Int. Cl.[2] G01C *9/18*
U.S. Cl. 356—249 **3 Claims**



1. An optical level for determining verticality comprising a housing, said housing being completely filled with three nonmiscible fluid media of different densities each of said media occupying corresponding one of three vertically spaced zones of said housing and defining horizontal bounding surfaces between adjacent zones, at least two transparent windows in the housing for the entrance and exit of a beam of light, said housing having a reference axis, said windows, in a position of the housing in which said reference axis is vertical, opening to and exiting from a central one of said three zones whereby a beam of light passing through said windows is propagated exclusively in said central zone, and said windows being inclined to and symmetrically disposed about said reference axis in said position, said medium of the least density and the medium of the greatest density having equal volumes and occupying upper and lower ones of said zones respectively and sandwiching the medium of medial density.

3,905,708

REFLEX SIGHTING DEVICE

William F. Steck, III, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.

Filed July 10, 1972, Ser. No. 270,356
Int. Cl.[2] G02B *23/10*
U.S. Cl. 356—251 **6 Claims**

1. A reflex sighting device for use with a projectile launcher, said device comprising:

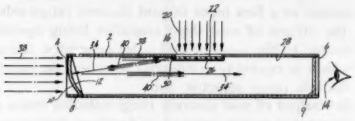
a. a tubular housing having an objective end and an ocular end;

b. highly reflective means mounted in said housing to provide a reflecting surface facing said objective end of said housing, said reflecting surface being configured to pro-

vide first reticle indicia for said device which first reticle indicia is illuminated by down range ambient light;

c. means mounted in said housing to provide second reticle indicia illuminated by surrounding ambient light;

d. fluorescent means mounted on said housing between the ocular and objective ends thereof and adjacent said second reticle indicia and operable to absorb surrounding ambient light, fluoresce the absorbed light and transmit the fluoresced light to said second reticle indicia to illuminate the latter;



e. dichroic partially reflecting means mounted in said housing between said first and second reticle indicia and said objective end of said housing, said reflecting means being operable to transmit downrange ambient light to said reflecting surface, and further operable to reflect images of said first and second reticle indicia toward said ocular end of said housing substantially along the axis of said housing; and

f. means in said housing focussed on said first and second reticle indicia to provide collimated images of said first and second reticle indicia.

3,905,709

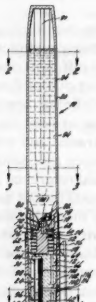
PEN WITH INJECTION SYSTEM

Edward Bok, Burgemeester Amersfoordtlaan 82, Badhoevedorp, Netherlands

Filed Feb. 5, 1974, Ser. No. 439,734

Int. Cl.[2] B43K *5/10*

U.S. Cl. 401—183 **9 Claims**



1. A pen, comprising:

a free ink reservoir,

a contained ink reservoir beneath said free ink reservoir and provided with a pen tip in communication therewith,

at least one ink injection channel positioned between said free ink reservoir and said contained ink reservoir,

manually operable injection means for transferring ink from said free ink reservoir to said contained ink reservoir along said channel, and

a venting system provided with venting passage means comprising a plurality of capillary ink buffer channels and a main venting channel of less capillarity than said ink buffer channels and in communication with a portion of said ink buffer channels, an opening within the wall of said contained ink reservoir and exposed to the atmosphere, and a cross venting channel connecting said opening to said venting passage means at a position intermediate the ends thereof such that a portion of said venting passage means extends upwardly beyond said cross venting channel.

3,905,710

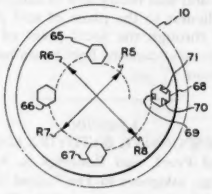
SHAFT COUPLING HAVING A KEYWAY INSERT AND METHOD FOR FORMING THE SAME

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and David R. Billings, Los Alamitos, all of Calif., assignors to Bearings, Seals, & Gears, Inc., Redwood City, Calif.

Filed Mar. 2, 1973, Ser. No. 337,565

Int. Cl.[2] F16D *1/08*

U.S. Cl. 403—4 **7 Claims**



1. A shaft coupling for installation on a cylindrical shaft having a key therein, comprising a central portion having a bore formed therein to fit the shaft and having additional surfaces defining a retaining groove parallel to and in communication with said bore, an insert having a polygonal cross section and external planar surfaces, said insert being formed to slidably fit in said retaining groove thereby preventing rotation of said insert in said retaining groove, said insert further being formed to assume one of a plurality of rotated positions in said retaining groove, whereby one of said insert external planar surfaces is in communication with said bore, a keyway formed in at least two of said insert external planar surfaces for receiving the key so that said insert may be installed in one of said rotated positions and said keyway may be placed in communication with said bore to engage the key, and means for retaining said insert in said retaining groove, thereby preventing rotation of the shaft coupling relative to the shaft.

3,905,711

CABLE CONNECTING ASSEMBLY

James B. Rogers, Lakeland, Fla., assignor to Marion Power Shovel Company, Inc., Marion, Ohio

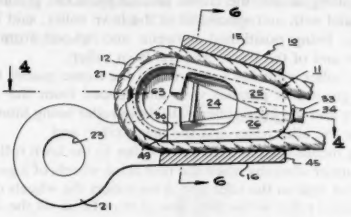
Filed Oct. 31, 1974, Ser. No. 519,775

Int. Cl.[2] F16G *11/04*

U.S. Cl. 403—16 **17 Claims**

1. A cable connecting assembly comprising a socket member having a passageway therethrough including converging, cable segment engaging surfaces and means for securing said socket member to a desired object, and a wedge assembly receivable within the passageway of said socket member including a pair of wedge members and a wedge shaped spreader member therebetween, said spreader member having a pair of converging, wedge seating surfaces, a forwardly projecting anvil disposed at the narrow forward end thereof, extending beyond a forward end of and outside said socket member when said wedge assembly is disposed within the passageway of said socket member, and a cable engaging surface disposed at the wide rearward end thereof, each of said wedge members including a surface engagable with a

wedge seating surface of spreader member and a surface engagable with a cable segment engaging a converging surface

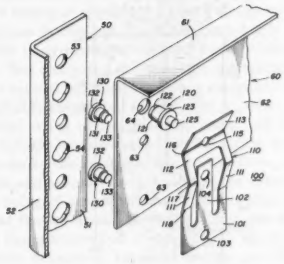


of said socket member when said wedge assembly is disposed within the passageway of said socket member.

3,905,712
SNAP LOCK FOR QUICKLY-DETACHABLE BEAM-TO-POST JOINT

Kennedy McConnell, Riverdale, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Sept. 27, 1973, Ser. No. 401,189
Int. Cl.² F16D *1/00*
U.S. Cl. 403—317 **15 Claims**

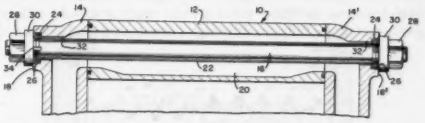


1. A snap lock for interconnecting an upstanding post member and an associated horizontal beam member having aligned apertures therein, said snap lock comprising a resilient body having an opening therein, means for mounting said body on one of the associated members, a lock pin having a mounting stud extending outwardly through said opening and trapped therein, a load bearing end carried by said mounting stud and constructed and arranged to pass through the aligned apertures in the associated members to interconnect the same, said mounting stud having a cross section slightly less than that of the associated opening for loosely fitting and tilting in said opening while being restrained from longitudinal shifting with respect to said body, the adjacent surfaces of said lock pin and said body diverging outwardly to provide for ready tilting movement therebetween, said body being resiliently deformable to permit said load bearing end to be withdrawn from the aligned apertures in the associated members, the resiliency of said body adapted to urge said load bearing end into the aligned apertures in the associated member and maintain said load bearing end therein, the loose engagement between said body and said mounting stud providing tilting movement of said load bearing end to facilitate fitting of said load bearing end into the aligned apertures of the associated members.

3,905,713
TIE BOLT SEALING MEANS

Arthur Lowell Black, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 28, 1974, Ser. No. 446,753
Int. Cl.² F16B *39/01*
U.S. Cl. 403—405 **12 Claims**



8. In an assembly of machine components, having a coolant chamber formed therein intermediate opposite end surfaces of said assembly, with a tie bolt in penetration of said chamber constraining said assembly together, means for sealing the tie bolt from coolant, comprising:

a sleeve, in penetration of said chamber and in envelopment of said tie bolt; and

sealing elements sealingly engaging terminal ends of said sleeve and supporting said sleeve in said chamber; and

said tie bolt having means on opposite ends thereof which abut said assembly end surfaces for tensioning and securing said tie bolt; wherein

at least one of said terminal ends of said sleeve is spaced apart from the bolt tensioning and securing means adjacent thereto; and

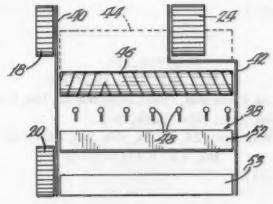
said tie bolt has axially-extending conduit means formed therein within one end thereof for the venting of said sleeve;

said conduit means opening internally within said sleeve, and externally outwardly beyond the tensioning and securing means adjacent thereto.

3,905,714
METHOD FOR RESTORING CONCRETE ROAD SURFACES

Glen E. Perkins, 18 7th St., East Moline, Ill. 61201

Division of Ser. No. 269,591, July 7, 1972, Pat. No. 3,844,670.
This application July 15, 1974, Ser. No. 488,427
Int. Cl.² E01C *3/06*
U.S. Cl. 404—72 **6 Claims**

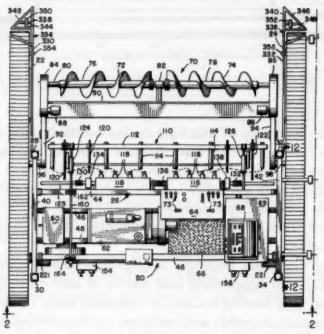


1. A process for restoring the surface of a concrete highway comprising the steps of disposing the slip form paving tools in overlying relation to one traffic lane and the contiguous shoulder of the highway, supporting said tools from a generally rectangular frame, supporting said frame essentially adjacent three corners thereof, namely, the front and rear corners contiguous to the other traffic lane and the front corner contiguous to the shoulder, driving said frame and tools by traction means located adjacent said three corners and adapted to ride respectively on the edge of the other traffic lane and on said shoulder forwardly of said tools, and simultaneously and continuously slip forming a fresh layer onto said one lane and the contiguous shoulder.

3,905,715
TRACK DRIVEN MACHINES WITH TORSION BAR-ACTIVATED CONTROLS

Charles Harry Dale, Rock Island, Ill., assignor to Pav-Saver Corporation, Moline, Ill.

Filed Apr. 17, 1974, Ser. No. 461,633
Int. Cl.[2] E01C *19/00*; F01N *1/00*
U.S. Cl. 404—84 **6 Claims**



1. A track driven machine comprising a horizontal frame, power driven, endless track means mounted on respective sides of said frame, mounting means between respective sides of said frame and respective track means allowing vertical movement of said frame relative to respective tracks, said mounting means including at least one hydraulic cylinder member connected to a track means and to said frame, hydraulic fluid pump means on said machine connected by hydraulic fluid lines to the hydraulic cylinder member, said hydraulic cylinder member supporting said frame on the track means for individually articulated, vertical movement of its supported portion of said frame relative to the track means, a torsion bar rigidly connected at one end thereof to said frame and adapted to register twisting forces in said frame as said machine moves along terrain, and hydraulic fluid control means operatively associated with said torsion bar for activating hydraulic movement of said hydraulic cylinder member to raise or lower said supported portion of said frame relative to the track means until the torsion bar-registered twist in said frame is relieved.

3,905,716
LAWN ROLLER DEVICE

John A. Farkas, Chardon, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,145
Int. Cl.[2] E01C *19/26*
U.S. Cl. 404—128 **4 Claims**

1. A lawn roller device for a garden tractor having a pair of front wheels rotatably mounted on a front axle and a pair of rear drive wheels, said lawn roller device comprising

a frame having a front end supported by the front axle and a rear end;

a lawn roller rotatably mounted in the frame at the rear end thereof in contact with the ground;

a single idler roller rotatably supported in the frame and extending across the frame spaced from the ground in parallel with and spaced from the lawn roller, said idler roller being positioned between and spaced from the front end of the frame and the lawn roller;

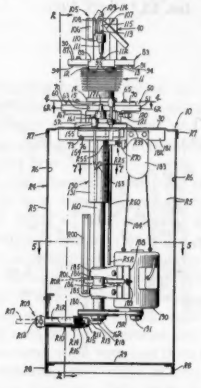
a drive roller rotatably supported in the frame spaced from the ground in parallel with and spaced from the idler roller and the lawn roller, said drive roller being intermediate the idler roller and the lawn roller; and

driving means coupling the drive roller to the lawn roller in a manner whereby when the rear drive wheels of a garden tractor rest on the idler and drive rollers the wheels drive the lawn roller in the direction of the wheels via the drive roller and the driving means.

3,905,717
BORING MACHINE

Daryl G. Brooks, Fresno, Calif., assignor to Porta-Tool, Incorporated, Clovis, Calif.

Filed June 4, 1973, Ser. No. 366,603
Int. Cl.[2] B23B *41/12*
U.S. Cl. 408—107 **10 Claims**

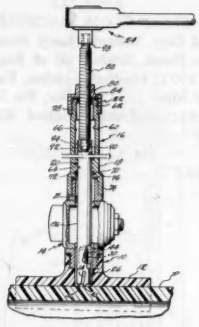


1. In a cylinder boring machine, the combination of a frame; a shaft mounted for rotation and endward movement in the frame, the shaft having a work end and an opposite power end; a cutting tool affixed on the work end of the shaft; a drive motor mounted in driving relation to the power end of the shaft; a cylinder support plate mounted on the frame defining a plane substantially normal to the axis of rotation of the shaft; a support borne on the frame adjoining the cylinder support plate; a slide member mounted on the support for adjustment toward and from the support plate; a pressure arm affixed on the slide member and positionable in spaced juxtaposition to the support plate; a pressure applying mechanism mounted on the slide member adjacent to the pressure arm; means mounted on the frame in engagement with the shaft for advancing the work end of the shaft between selected retracted and advanced cutting positions with respect to the support plate upon rotation of the shaft; a motor control switch mounted in the frame and a switch actuating arm extended from the shaft; and a cutting position control linkage mounted on the frame in operable connection with the switch, the linkage having an endwardly adjustable throw rod mounted in the frame in alignment with the arm extended from the shaft.

3,905,718
DRIVING TOOL

Lawrence F. Luckenbill, and Daniel A. Ellis, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Division of Ser. No. 425,791, Dec. 18, 1973, Pat. No. 3,870,431. This application Oct. 31, 1974, Ser. No. 519,655
Int. Cl.² B23B 47/18
U.S. Cl. 408—111 7 Claims



1. A drilling tool for drilling a hole in a pipe, the drilling tool being adapted to be connected to a fitting having a passageway therethrough and fixedly attached to the pipe, said drilling tool comprising;

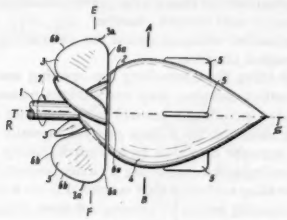
an elongated tubular body member having one end attached to the fitting in alignment to the passage therethrough, a two-piece boring bar extending completely through said tubular body member, said two-piece boring bar including a first elongated member of predetermined diameter and a second elongated member exteriorly threaded and detachably connected to said first member, said second member being of less diameter than said first member, said tubular body member having a first bore at its end opposite to the end attached to the fitting and through which said second elongated member extends, said first bore being of a reduced diameter less than the diameter of said first elongated member to prevent the boring bar from being blown out of the same, a disengagement nut member detachably received on the end of said tubular body member having said first bore, said disengagement nut member having a threaded bore therethrough for receiving the threaded second member whereby said boring bar can be rotatively advanced and retracted, said boring bar being capable of rapid positioning when said disengagement nut is detached from said body member, and a cutter member operatively connected to said first elongated member at its ends opposite to its detachable connection to said second elongated member.

3,905,719
PROPELLER

Willy Minnich, Windhukstrasse 9, 2 Hamburg 50, Germany

Filed Aug. 15, 1973, Ser. No. 388,625
Int. Cl.² F01D 25/28; F04D 3/00
U.S. Cl. 415—126 10 Claims

1. A propeller for a water craft, comprising a stationary streamlined body of displacement having a leading end, a trailing end, and an axis of symmetry passing through said ends; and a propeller wheel, comprising a hub mounted adjacent said body at said leading end and having an outer circumferential surface which tangentially merges with an outer circumferential surface of said body, said hub being rotatable about an axis of rotation which coincides with said axis of symmetry, said propeller wheel further comprising a plurality of propeller blades mounted on said hub for rotation therewith, and projecting outwardly as well as a substantial distance forwardly beyond said hub in direction away from said leading end thus circumferentially surrounding an unrestricted space in the region where the propeller blades extend forwardly beyond said hub, said propeller blades each having a curved trailing edge and a leading edge which is curved to a substantially greater extent than said trailing edge and which leading edge is substantially longer than said trailing edge, said propeller blades further having inner portions adjacent said hub and enclosing an acute angle with a radial plane including

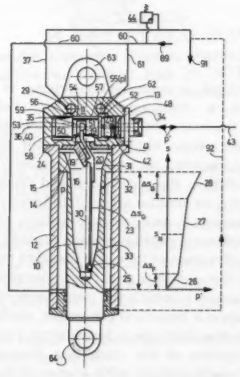


said axis of rotation, whereby said blades are so configurated that liquid is drawn from said unrestricted space in said region where said propeller blades extend forwardly beyond said hub and in between said leading edges, and the liquid is propelled toward said trailing edges and then along said stationary streamlined body in rearward direction substantially parallel to said axis of symmetry, the relationship of the maximum diameter of said body in a plane normal to said axis of symmetry relative to the maximum diameter of said propeller wheel in a plane normal to said axis of rotation being greater than 0.6:1.

3,905,720
APPARATUS FOR ADJUSTING TURBINE GUIDE VANES AND THE LIKE

Christian Greune, Furstenfeldbruck, and Hilbert Holzhauer, Stetten, both of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Germany

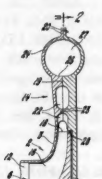
Filed July 8, 1974, Ser. No. 486,441
Claims priority, application Germany, July 7, 1973, 2334670
Int. Cl.² F03B 15/04
U.S. Cl. 415—148 35 Claims



1. Apparatus for imparting adjusting movements to a movable member, comprising:

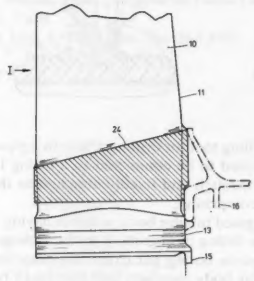
an actuating cylinder,
an actuating piston slidably disposed in said cylinder,
one of said actuating cylinder and actuating piston including means for connecting same to said movable member for movement therewith,
a control chamber communicating with a first face of said actuating piston such that supply of fluid under pressure to said control chamber effects movement of said actuating piston in a first direction and drainage of fluid from said control chamber perm its movement of said actuating piston in a second direction opposite said first direction,
control chamber inlet means for communicating fluid under pressure to said control chamber,
control chamber exhaust means for exhausting fluid from said control chamber,
a control valve for controlling the opening and closing of said control chamber inlet and exhaust means, said control valve including a control valve member acted upon in one direction by a fluid control pressure and in the other opposite direction by a control biasing force,
said actuating piston including a cavity bounded in part by a generating surface which is spaced from a centerline of said actuating piston by varying amounts along the length of said actuating piston, and interconnecting means in contact with both said control valve member and said generating surface for effecting changes in said control biasing force as a function of the position of said actuating piston along the travel path thereof in said actuating cylinder.

3,905,721
CENTRIFUGAL COMPRESSOR DIFFUSER
Paul Fitzpatrick, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 3, 1974, Ser. No. 502,830
Int. Cl.[2] F04D *29/44*
U.S. Cl. 415—211 **5 Claims**



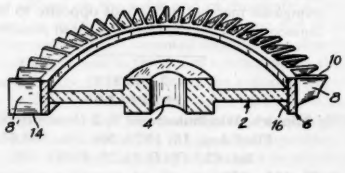
1. A centrifugal compressor comprising, in combination, a rotor operable to discharge gas at high velocity from the periphery of the rotor with radial and tangential components of velocity and a stator enclosing the rotor, the stator including a diffuser disposed around the periphery of the rotor to receive and diffuse the gas discharged from the rotor, the diffuser defining an annular array of diffusing passages extending radially outwardly and circumferantially from the rotor, at least the downstream portion of each passage being divergent in area in the direction of flow, the passages intersecting at the entrances to the passages and being discrete at the outlets from the passages, in which the improvement comprises passages based upon a branched centerline, each passage having a single centerline through a downstream portion of the passage, the branches of the centerline diverging toward the entrances to each passage with one branch forward of the other with respect to the tangential component of velocity of the gas, the foward branch of each passage intersecting the other branch of the next adjacent passage at the inner periphery of the diffuser, each passage having a basic racetrack cross-section substantially as defined by opposed substantially semicircular arcs centered on the respective branches of the centerline and straight line segments connecting the arcs forward of the point of merging of the branches, adjacent basic cross-sections overlapping at the entrances to the passages so that generally elliptical leading edges of the walls separating the passages are provided at the zone of transition from intersecting to discrete passages.

3,905,722
FLUID FLOW MACHINES
Kenneth Ronald Guy, Bristol; Harry Dennis, Somerset, and Robert Burns Hood, Bristol, all of England, assignors to Rolls-Royce (1971) Limited, London, England
Filed Mar. 12, 1973, Ser. No. 340,118
Claims priority, application United Kingdom, Mar. 15, 1972, 11954/72
Int. Cl. F01d *5/22*
U.S. Cl. 416—193 **3 Claims**



1. A rotor for a fluid flow machine comprising a rotor body; an annular array of blades connected to and extending radially from said body, each blade having an aerofoil portion whose radially inner end terminates in a position spaced from the periphery of the body and a shank extending between the aerofoil portion and said periphery; and platform means made of a cellular material arranged between adjacent shanks.

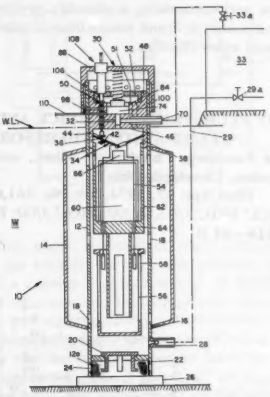
3,905,723
COMPOSITE CERAMIC TURBINE ROTOR
Maurice L. Torti, Jr., Boston, Mass., assignor to Norton Company, Worcester, Mass.
Filed Oct. 27, 1972, Ser. No. 301,472
Int. Cl. F01d *5/28*
U.S. Cl. 416—241 **8 Claims**



1. A composite ceramic turbine rotor comprising:
a hub section, and a blade section permanently joined thereto, wherein the specific gravity of said hub section is 90 to 100%, and the specific gravity of said blade section is 60 to 90%, of the theoretical specific gravity of the ceramic material of which they are composed, said ceramic material of said hub section and said blade section is one selected from the group consisting of silicon nitride, silicon carbide, and mixtures thereof, and wherein

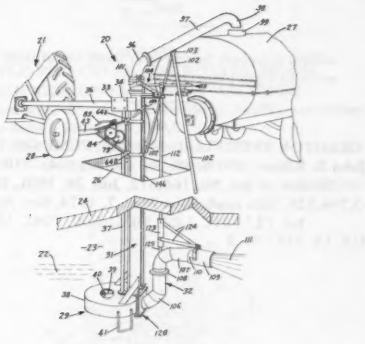
said blade section is coated with an impervious coating of a refractory material.

3,905,724
PNEUMATIC PUMP
David W. Strebel, 4380 Hall Rd., Santa Rosa, Calif. 95401
Filed Feb. 7, 1974, Ser. No. 440,451
Int. Cl.[2] F04F *1/06*
U.S. Cl. 417—128 **8 Claims**



1. In a pneumatic pump comprising:
a vessel adapted to be immersed in a body of liquid;
liquid inlet and outlet one-way check ports near the bottom of said vessel; and
gas valve means for discharging liquid from said vessel comprising:
a servo valve body;
a gas exhaust port in said body connected between said vessel and a zone at low pressure;
a gas charge port in said body in alignment with said exhaust port and connected between the interior of said vessel and a source of pressurized gas;
an exhaust stop valve and a charge stop valve operative to close said gas exhaust and charge ports, respectively;
a gas chamber in said valve body;
a gas pressure-responsive member mounted in said chamber for movement therein in opposite directions;
said exhaust and charge stop valves being carried on said pressure-responsive member and movable together therewith, said stop valves being so disposed that a force on one side of said pressure-responsive member moves said exhaust and charge stop valves together to close said exhaust port and open said charge port and a force on the other side of said pressure-responsive member moves said stop valves together to open said exhaust port and close said charge port;
a load vent duct opening into said chamber on said one side of the pressure-responsive member;
biasing means of said other side of said pressure-responsive member;
a primary vent duct connecting said load-vent duct to a low pressure zone;
a gas load duct adapted to be connected to a source of pressurized gas;
a pilot valve flow passage connecting said gas load duct and said primary vent duct to said load-vent duct;
a two-position pilot valve movable in said valve flow passage between one position wherein it blocks the connection between said load-vent duct and said primary vent duct, and the other position wherein it blocks the connection between said load-vent duct and said gas load duct; and
means operative when liquid in said vessel reaches a predetermined high level to move said pilot valve to said one position and means operative when liquid in said vessel reaches a predetermined low level to move said pilot valve to said other position.

3,905,725
PUMP APPARATUS
Roger L. Johnson, Wayzata, Minn., assignor to VEDA, Inc., Long Lake, Minn.
Filed July 17, 1974, Ser. No. 489,259
Int. Cl.[2] F04B *35/06*
U.S. Cl. 417—231 **23 Claims**

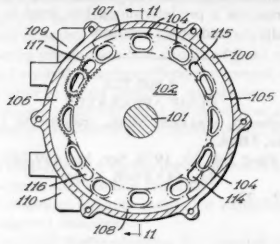


1. A pump apparatus for moving material, as liquid manure, comprising: a housing having an inlet opening, first means connected to the housing having a first material discharge passage, second means connected to the housing having a second material discharge passage, first valve means for selectively stopping and permitting the flow of material through the first passage, second valve means for selectively stopping and permitting the flow of material through the second passage, means cooperating with the housing for moving material from the inlet through the housing and into the first passage and second passage, and control means operably connected to the first valve means and second valve means for operating said first and second valve means whereby both the first and second valve means cannot be in flow stopping positions at the same time.

3,905,726
PLANETARY GEAR PUMP
John T. Gondek, Columbia Heights, Minneapolis, Minn. 55421
Division of Ser. No. 267,560, June 29, 1972. This application Nov. 21, 1973, Ser. No. 417,765
Int. Cl. F01c *5/04, 1/08*
U.S. Cl. 418—56 **5 Claims**

1. A fluid pump comprising:
a generally cylindrical drive member adapted for rotation about its axis and having gear teeth about its circumference to form a sun gear;
a housing surrounding and supporting said drive member and having a flexible inner circumferential surface disposed at a varying distance from said generally cylindrical drive member so as to form a pumping chamber therebetween said inner surface having gear teeth to form a ring gear;
inlet and outlet passageways in communication with said pumping chamber;
a plurality of flexible rolling members held between said drive member and said inner circumferential surface adapted to be rolled by said drive member about said

flexible inner surface and carry fluid through said pumping chamber from said inlet ports to said outlet ports said



rolling members having gear teeth about their circumference to form planetary gears.

3,905,727

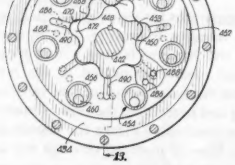
GEROTOR TYPE FLUID MOTOR, PUMP OR THE LIKE

John B. Kilmer, 900 S. 8th St., Lamar, Colo. 81052

Division of Ser. No. 166,672, July 28, 1971, Pat. No. 3,796,525. This application Mar. 7, 1974, Ser. No. 448,993

Int. Cl.[2] **F01C** *1/02*; **F03C** *3/00*; **F04C** *1/02*

U.S. Cl. 418—61 B **6 Claims**



1. In a device of the class including fluid motors, pumps and certain activators, meters, couplers and the like, in which energy is translated from fluid to mechanical or from mechanical to fluid manifestations thereof, the combination of:

a pair of elements,

said elements being relatively movable with respect to each other;

means for supporting said elements for relative rotational movement therebetween;

a member,

said member being relatively movable with respect to each of said elements respectively;

means for effecting both fluid and mechanical couplings between said member and one of said elements,

said coupling means including interengaging epicyclic gear means having cooperating tooth means on said member and said one element respectively, said tooth means on said member having a different number of teeth than said tooth means on said one element to provide a mechanical gear ratio different from unity between said member and said one element, said gear means presenting a plurality of fluid displacement chambers between said member and said one element, the effective volumes of said chambers being individually variable and at any given time dependent upon the relative positions of said member and said one element,

said coupling means additionally including means for selectively effecting fluid ingress and egress connections with said chambers in a predetermined order for the selective introduction or removal of fluid; and

further means, separate from and operably sufficient independently of said coupling means, for supporting said member for predetermined relative movements between said member and each of said elements respectively and for limiting said predetermined movements to relative orbital movement between said member and said other element and to relative orbital and rotational movements between said member and said one element,

said further means providing said support for the member and said limitation of relative movements between the member and the respective elements without reliance upon mechanical forces transmitted through said tooth means and comprising a plurality greater than two of spaced eccentric crank means intercoupling said member and said other element.

3,905,728

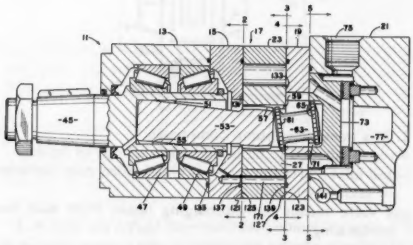
ROTARY FLUID PRESSURE DEVICE AND PRESSURE RELIEF SYSTEM THEREFOR

Nils Einar Swedberg, Chanhassen, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 17, 1974, Ser. No. 461,688

Int. Cl.[2] **F01C** *1/02, 21/00*; **F03C** *3/00*; **F04C** *1/02*

U.S. Cl. 418—61 B **27 Claims**



1. A rotary fluid pressure device, comprising:

a. a housing having a fluid inlet port and a fluid outlet port and defining at least a first surface therein;

b. an internally-toothed member and an externallytoothed member eccentrically disposed within said internally-toothed member for relative orbital and rotational movement therebetween, the teeth of said members interengaging to define a plurality of expanding and contracting volume chambers during said relative movement;

c. valve means;

d. means connecting said valve means for synchronous movement with one of said movements of said toothed members, said valve means being operable upon said synchronous movement to connect one of said ports in fluid communication with said expanding volume chambers and the other of said ports in fluid communication with said contracting volume chambers;

e. said toothed members having first axial end faces abuttingly engaging said first housing surface, said housing surface and one of said first axial end faces cooperating to define a first sealing land radially adjacent said volume chambers and at least one area of relieved pressure, including a fluidicly continuous groove, said sealing land being disposed radially between said volume chambers and said area of relieved pressure;

f. said area of relieved pressure being at least about as wide in a radial direction as said sealing land; and

g. passage means disposed within said housing for connecting said relieved area in open communication with one of said ports to reduce the area subjected to fluid pressure tending to separate said faces from said surface during operation of said device.

3,905,729

ROTARY PISTON

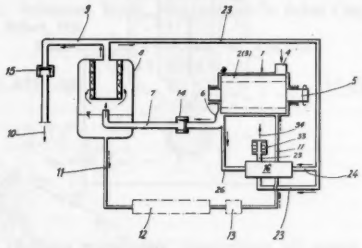
Heinz Bauer, Munich, Germany, assignor to Bauer-Kompressoren, Hans Bauer, Munich, Germany

Filed Feb. 20, 1974, Ser. No. 443,982

Claims priority, application Germany, Feb. 20, 1973, 2308265

Int. Cl.[2] F01C *21/04*; F04C *29/02*

U.S. Cl. 418—84 9 Claims



1. In a rotating piston compressor plant utilizing an oil separator in a gas conduit between the pressure side of a compressor and a consumer output and an oil feedback line between the oil separator and the compressor, and having a first check valve in the gas conduit line between the compressor and the oil separator and a second check valve between the oil separator and the consumer output, said check valves being closed when the compressor is shut off, an apparatus for simultaneously relieving the gas pressure on the oil separator and for blocking the feedback of oil to the compressor when the compressor is shut off comprising:

a relief line for exhausting gas from said oil separator,

a combination valve in said feedback line and in said relief line having an open position for permitting feedback of oil to said compressor and for blocking said relief line and a closed position for blocking said feedback line and opening said relief line, and

means for automatically actuating said valve to the open position by expanding gas from the pressure side of said compressor when said compressor is on and for actuating said valve to the closed position at least by expanding gas from said oil separator when said compressor is shut off.

3,905,730

INTERIOR SEAL FOR THE PISTON OF A ROTARY PISTON ENGINE

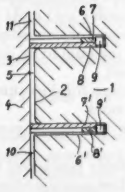
Max Ruf, Obereisenheim, Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft and Wankel G.m.b.H., Germany

Filed Jan. 29, 1974, Ser. No. 437,659

Claims priority, application Germany, Feb. 3, 1973, 2305445

Int. Cl.[2] F01C *19/00*, *19/08*

U.S. Cl. 418—142 3 Claims



1. An interior seal for the piston of a rotary piston engine of trochoid construction comprising: a housing and a piston having an annular groove in one face thereof, the housing having an end wall adjacent the groove, a spring ring, at least two metal scraper rings each immediately superimposed radially and are arranged axially movable together in the annular groove in one face of the piston and pressed against the adjacent end wall of the housing by the spring ring, scraper rings having recesses arranged alternately in axial direction and are so superimposed and secured against rotation that the recesses of one scraper ring are staggered in relation to the other scraper ring, the recesses of each scraper ring being distributed segment-wise over equal sectors arranged in staggered relation to the corresponding sectors of the other scraper ring, so that the sectors of one scraper ring are covered by unrecessed sectors of the other scraper ring thereby permitting the recesses in each ring to be arranged very close to each other thereby improving the flexibility of that sector of the ring and insuring a very good contact with the adjacent end wall of the housing.

3,905,731

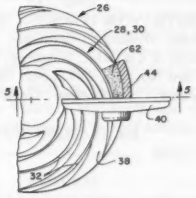
BAFFLE STRUCTURE FOR ROTARY WORM COMPRESSION-EXPANSION MACHINES

Bernard Zimmern, 27, rue Delabordere, Neuilly sur Seine (Hauts-de-Seine), France

Filed Oct. 4, 1974, Ser. No. 512,143

Int. Cl.[2] F04C *17/04*

U.S. Cl. 418—195 4 Claims



1. In a rotary worm compression-expansion machine having a rotor defining oppositely facing concentric spiral screws rotatably supported in a casing on the central axis thereof, each such screws having a plurality of spirally extending threads projecting upwardly from a coaxial annular depression part circular in radial cross-section, the inner surface of the casing having a portion positioned to be swept by the threads and define therewith a plurality of compression-expansion chambers, fluid inlet means in the casing opening adjacent to the periphery of the rotor and fluid outlet means near the center of the rotor, a pair of pinion wheels projecting into said casing and having teeth meshing with each of such screws, the teeth on each pinion meshing with at least two but not more than three threads on each of such screws at any one time, the improvement comprising; a pair of baffles located at and in sealing engagement with the periphery of each of the concentric screws and in sealing engagement with the pinions.

3,905,732

EXTRUSION PRESS FOR MAKING HOLLOW CONCRETE BODIES

Maxime Jean Rouvin; Paul Fernand Rouvin, and Philippe Edmond Rouvin, all of 11 Ave. General Sarrail, Lunel, Herault, France

Filed Jan. 15, 1974, Ser. No. 433,489

Claims priority, application France, Jan. 24, 1973, 73.02496

Int. Cl.[2] B28B *3/24*

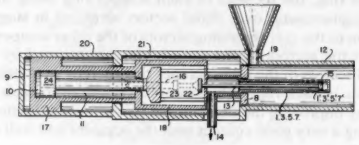
U.S. Cl. 425—85 13 Claims

1. An extrusion press suitable for the production of hollow concrete bodies comprising:

a. a frame;

b. a mould the exterior of which is defined by a stationary casing fixed to the frame, said mould terminating in an extrusion outlet;

c. inlet means for introducing concrete into the mould;
d. at least one perforated core movable in a direction parallel to the longitudinal axis of the mould, closed at one end and open at the other end;
e. vacuum means in communication with each perforated core for imposing a vacuum on each perforated core;



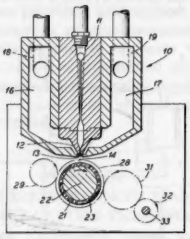
f. at least one nonperforated core;
g. reciprocatingly movable concrete compression means for pushing the concrete through the mould and the extrusion outlet; and
h. means in communication with the concrete compression means for maintaining the concrete under compression until each perforated core has substantially reached its rearmost position away from the extrusion outlet.

3,905,733
PLASTIC WEB FORMING APPARATUS
Kurt Neumann, Wegberg, Germany, assignor to Wilhelm Leeser GmbH & Co. KG., Wegberg, Germany
Filed Nov. 26, 1973, Ser. No. 418,924
Claims priority, application Germany, Dec. 7, 1972, 2259834
Int. Cl.[2] B29D *27/04*
U.S. Cl. 425—224 **3 Claims**

1. Apparatus for the continuous production of foam plastic profiles, particularly on a polyurethane basis, comprising an endless recirculating longitudinally flexible and lengthwise-slit hollow belt which is sufficiently resilient to normally urge the edges of the slit together, said hollow belt thereby providing an endless forming cavity, means for opening the slit in the belt during a portion of its length of travel to provide an opening to the belt cavity, means for feeding the foam plastic into the belt cavity through said opening, the foamed plastic profile also being discharged through said opening ahead of and adjacent to the feeding means, the opening in the belt extending from ahead of where the profile is discharged to beyond where the foam plastic is fed into the cavity with respect to the direction of travel of the belt.

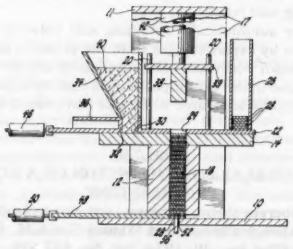
3,905,734
CONTINUOUS TUBE FORMING BY MELT BLOWING TECHNIQUE
Eugene R. Blair, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Dec. 26, 1973, Ser. No. 427,727
Int. Cl.[2] B29C *13/00, 15/00*
U.S. Cl. 425—224 **6 Claims**

1. Apparatus for continuously making a tube of melt blown microfibers comprising
a. a mandrel having a circumferential surface,
b. support means supporting said mandrel and adapted to permit said mandrel to rotate on its axis,
c. means for rotatably driving said mandrel from one end thereof,
d. means for continuously generating a generally planar configuration of melt blown microfibers, said means being adapted to deposit longitudinally upon a prechosen length of said circumferential surface a web of melt blow microfibers, and



e. means for continuously withdrawing generally axially from the free end of said mandrel a tubular web of microfibers formed on said circumferential surface as said mandrel so rotates and as said microfibers are so deposited, said withdrawing means revolving at substantially the same rate as said mandrel.

3,905,735
STACK MOLDING APPARATUS
Douglas A. Thomas, and Terry L. Stambaugh, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 401,882, Sept. 28, 1973. This application Sept. 11, 1974, Ser. No. 505,166
Int. Cl.[2] B30B *7/02, 11/06*
U.S. Cl. 425—256 **4 Claims**



3. Stack molding apparatus for compaction of moldable particulate material comprising:
a vertically disposed open ended mold supported for slight vertical movement and in spaced relation to a base plate and means for raising said mold at least a slight amount,
first transfer means for depositing a measured charge of said particulate material to be compacted into the top of said vertical mold,
second transfer means for depositing a separator plate into the top of said mold,
vertically movable ram means positioned over the top of said mold,
ejector means slidably positioned on said base plate movable between a first position removed from said mold and a second position beneath said mold,
control means for sequentially causing said first transfer means to deposit a charge of said material into the top of said vertical mold for causing said second transfer means to deposit a separator plate over said charge, for causing

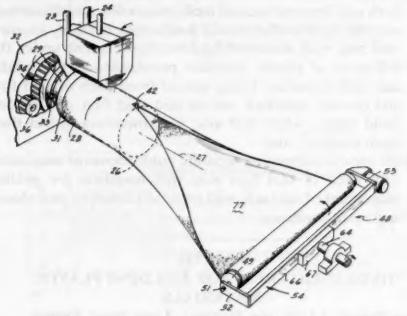
said ram to subject said separator plate to pressure while said ejector means is in said second position, for causing said mold to be lifted slightly, and for causing said ejector means to eject the lowermost separator plate and compacted article from said stack.

3,905,736

SHEET WEB GENERATION VIA A TUBULARLY FORMED WEB

David J. Bringman, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 26, 1973, Ser. No. 428,066
Int. Cl. B29d 7/16
U.S. Cl. 425—308 15 Claims



1. Apparatus for continuously making a tube of melt blown microfibers comprising

a. mandrel means,

b. support means supporting said mandrel in the region of one end thereof,

c. means for continuously generating a generally planar configuration of melt blown microfibers, said means being adapted to deposit longitudinally upon circumferential surface portions of said mandrel means a web of melt blown microfibers,

d. means for rotatably moving said circumferential surface portions as said microfibers are being deposited thereupon and adapted to cause said microfibers to form a tubular web thereupon,

e. means for axially moving relative to said mandrel means such tubular web comprised of said microfibers towards and past the opposite end region of said mandrel, and

f. cutting means located in said opposite end region and adapted to exert a cutting action on such tubular web as the web moves axially.

3,905,737

DEVICES FOR COMPRESSING CROP

Cornelis van der Lely, 7, Briischerrain, Zug, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands

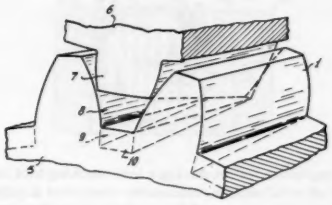
Filed Mar. 23, 1972, Ser. No. 237,374
Claims priority, application Netherlands, Mar. 26, 1971, 7104077
Int. Cl. B29b 1/03
U.S. Cl. 425—363 33 Claims

1. A device for compressing crop which comprises:

a first member comprising a gear wheel which is adapted to rotate about an axis of rotation and has at least two side by side teeth extending therefrom;

a second member comprising a further gear wheel which is adapted to rotate about a second axis of rotation and has at least one further tooth adapted to be moved by rotation of said gear wheels relatively between said first mentioned side by side teeth;

means defining a space for compressing crop which comprise adjacent sides of said first mentioned teeth, the surface of said gear wheel between said first mentioned teeth and the addendum surface of said further tooth received in said space; at least two of said space defining means converging relative to each other whereby when said further tooth moves between said first mentioned teeth with crop in said space said crop is compressed between said converging space defining means with a



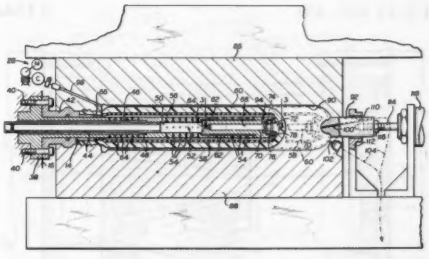
portion of the compressive forces urging crop so compressed in a direction which is in opposition to the converging direction of said space defining means, the addendum surface of said further tooth received in said space being inclined relative to said second axis of rotation whereby in a plane containing said said second axis of rotation and passing through said addendum surface the line in said plane where it intersects said surface is inclined relative to said second axis of rotation.

3,905,738

APPARATUS FOR LONGITUDINAL STRETCH FOR BLOW MOLDING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Filed Feb. 12, 1974, Ser. No. 441,811
Int. Cl.[2] B29C 1/12, 5/06
U.S. Cl. 425—389 10 Claims



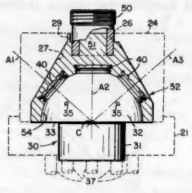
1. Blow molding apparatus including in combination a core rod, an elastic balloon attached to the core rod at the neck end thereof, the balloon hugging the core rod when the balloon is in a deflated condition preparatory to having a parison applied over the outside surface of the balloon, and an end portion of the core rod remote from the neck end of the rod that moves axially to extend the length of the core rod so that the balloon and the parison thereon are stretched lengthwise, means for supplying fluid pressure to the interior of the balloon, characterized by means limiting the expansion of the balloon and parison transverse of the longitudinal axis of the core rod while the balloon and parison are being stretched lengthwise of the core rod.

3,905,739

APPARATUS FOR PRODUCING LENS BLOCKING TOOLS

Charles L. Gill, 1267 Arrowhead Beach, Dresden, N.Y. 14441

Division of Ser. No. 311,399, Dec. 1, 1972, Pat. No. 3,866,660.
This application Sept. 17, 1974, Ser. No. 506,715
Int. Cl.[2] B29D *11/00*; B29F *1/00*
U.S. Cl. 425—405 R 7 Claims



1. Apparatus for producing a lens blocking tool, comprising a pair of mold sections releasably connected together,

a projection on one of the sections extending into a cavity in the other section in spaced, confronting relation thereto,

one of the confronting surfaces on said projection and said other section, respectively, being segmental spherical in configuration,

a plurality of inserts, each having in one end a circular recess for accommodating a lens blank,

means for releasably securing the recessed ends of said inserts on said segmental spherical surface with the open ends of said recesses sealed by said surface, and with the axes of said inserts extending through the center of curvature of said surface, and

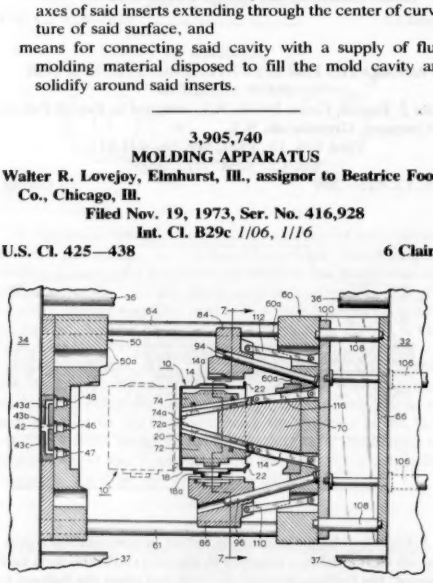
means for connecting said cavity with a supply of fluid molding material disposed to fill the mold cavity and solidify around said inserts.

3,905,740

MOLDING APPARATUS

Walter R. Lovejoy, Elmhurst, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Nov. 19, 1973, Ser. No. 416,928
Int. Cl. B29c *1/06*, *1/16*
U.S. Cl. 425—438 6 Claims



1. An injection mold for manufacture of a plastic article having plural side walls and only one closed end wall forming a generally polygonal enclosure with an open top, said mold comprising:

first mold means having a mold defining surface corresponding to the exterior dimensions of said end wall and a first portion of the contiguous plural side walls of said article and further having first interlock means;

core mold means comprising a plurality of relatively movable members cooperatively defining a mold core corresponding to the interior dimensions of said article;

second mold means for supporting said core mold means and including second interlock means;

side wall mold means disposed intermediate said first and second mold means and comprising plural separable side wall members movable between a closed position in which said plural members cooperatively form a mold defining surface corresponding to the exterior dimensions of a second portion of the contiguous plural side walls of said article and an open position in which said side wall members are displaced laterally and longitudinally of their closed position, the opposed end portions of said plural side wall members interfitting with respectively said first and second interlock means and the intermediate portions of said side wall members being spaced from both said first and second mold means when said side wall members are in their closed position for securely locating said side wall members against displacement under the influence of plastic injection pressures and said plural side wall members being spaced from each of said first and second interlock means and said first and second mold means when said side wall members are in their open position; and

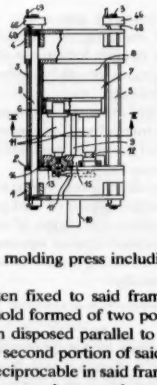
guide means comprising separate guide elements associated with each of said four side wall members for guiding movement of said side wall members between said closed and open positions.

3,905,741

HYDRAULIC PRESS FOR MOLDING PLASTIC MATERIALS

Pierre Poncet, 12 bis, rue Trarieux, Lyon 3eme, France

Filed Oct. 25, 1973, Ser. No. 409,616
Claims priority, application France, Oct. 27, 1972, 72.38860
Int. Cl.[2] B29F *1/06*
U.S. Cl. 425—450.1 8 Claims



1. In a hydraulic molding press including:

a frame;

a stationary platen fixed to said frame to support a first portion of a mold formed of two portions;

a movable platen disposed parallel to said first platen and supporting the second portion of said mold, said movable platen being reciprocable in said frame towards and away from said stationary platen to close or open said first and second mold portions with respect to each other;

long stroke approach ram means fixed to said frame to actuate said movable platen to opened and closed positions of said mold;

a stationary plate having at least one opening therethrough and the plate being fixed to said frame;

short stroke clamping ram means having cylinder means attached to said movable platen and having piston rod means extending toward said at least one opening in said stationary plate when said mold has been closed to maintain said mold portions against each other;

and locking means operative to block said piston rod means of the clamping ram means with respect to said stationary plate during operation of said clamping ram means;

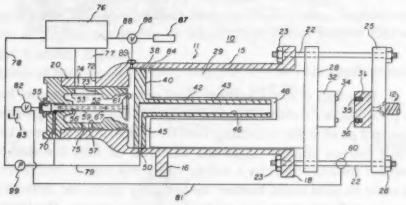
the improvement comprising in said molding press said locking means being carried by the piston rod means, and said at least one opening through said stationary plate being located and of such size that the piston rod means and the locking means and the cylinder means of the corresponding clamping ram means when the locking means is unblocked can pass freely through said at least one opening in the stationary plate and extend on the other side of the plate from said stationary platen during displacement of said movable platen by the approach ram means to fully open position of said mold.

3,905,742

VALVE FOR AN INJECTION MOLDING MACHINE

David W. McCarty, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Sept. 30, 1974, Ser. No. 511,022
Int. Cl.² B29F *1/06*
U.S. Cl. 425—451.2 **7 Claims**



1. An injection molding machine having a pair of platens a mold half mounted on each of said platens spring means associated with at least one of said mold halves for exerting a force on the other of said mold halves in a closed position, a clamp cylinder, a movable main ram disposed within the cylinder to open and close one of the platens, a prefill valve disposed adjacent said main ram, said prefill valve having a valve body disposed within the cylinder, said valve including a valve stem slidably disposed within the body, a closure member secured to one end of the stem, a fluid passage means in said valve body in fluid communication with said main ram, high pressure fluid supply means fluidly connected to said passage means when said closure member is seated, the improvement comprising:

said passage means being of a size so that the pressure drop therethrough creates a force at least equal to or greater than the force exerted by said spring means when said mold halves are closed.

3,905,743

EXTRUSION APPARATUS FOR FORMING THIN-WALLED HONEYCOMB STRUCTURES

Rodney D. Bagley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 196,986, Nov. 9, 1971, Pat. No. 3,790,654. This application July 27, 1973, Ser. No. 383,388
Int. Cl.² B29F *3/04*
U.S. Cl. 425—464 **3 Claims**

1. Apparatus for forming honeycomb articles which comprises:

A. a plurality of sheets of material each having opposed faces bounded by top and bottom edges;

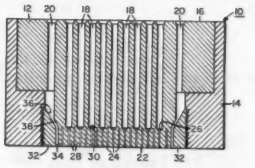
B. a plurality of said sheets each having a groove formed in one of said opposed faces, open to said bottom edge, and closed by the other of said opposed faces;

C. additional grooves formed in said sheets open to said bottom edges and open at least to one of said opposed faces of such sheets;

D. said sheets being stacked together to form a unitary extrusion die with adjacent faces of said stacked sheets lying parallel to the axis of extrusion of said die;

E. said extrusion die having a die body provided with an inlet face and an outlet face;

F. a plurality of feed passageways formed in said inlet face and extending longitudinally inwardly within said die body parallel to the axis of extrusion;



G. said grooves open to said bottom edge of said sheets of material providing a plurality of interconnected dishcarge slots in said outlet face which extend inwardly along said adjacent faces into communication with inner ends of said longitudinal feed passageways; and

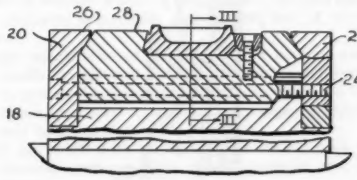
H. said discharge slots having means for providing resistance to batch flow which is sufficient to insure that the batch material will flow laterally together within the depth of said discharge slots.

3,905,744

DIE MEMBER FOR BRIQUETTING APPARATUS

Bruce C. Woodward, Greensburg, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Division of Ser. No. 302,515, Oct. 31, 1972, Pat. No. 3,829,267. This application Mar. 27, 1974, Ser. No. 455,136
Int. Cl. B29c *1/00*
U.S. Cl. 425—471 **9 Claims**

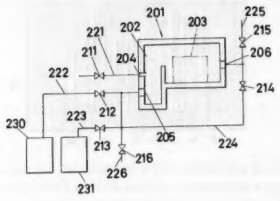


1. A die member for a briquetting wheel, the briquetting wheel having a radially outwardly opening circumferential groove for receiving a plurality of like die members in end to end relation, each said die member comprising a block of cemented hard metal carbide material having pocket means on the radially outer side when the block is mounted in the groove, each said block also having a radially inner face and having said edge and planar end edges, said pocket means being convex outwardly when viewed from the side, said radially inner face adapted to rest on the bottom of the groove in the wheel, the said planar end edges of said block converging in the radially inward direction, said side edges being parallel when viewed in the radial direction and when viewed from an end of said block being convergent in the radially outward direction.

3,905,745
METHOD OF PREVENTING FORMATION OF HARMFUL COMBUSTION GASES IN COMBUSTION FURNACE

Kichiro Konda, Tokyo, Japan, assignor to Denyo Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1973, Ser. No. 425,621
Claims priority, application Japan, July 31, 1973, 48-86145
Int. Cl. F231 7/00
U.S. Cl. 431—2 5 Claims

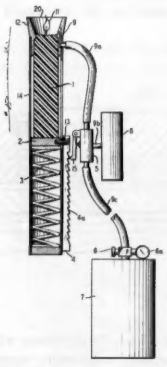


1. In a process wherein a fuel is combusted, the improvement which comprises combusting said fuel in an atmosphere which is substantially free of chemically uncombined nitrogen so as to reduce the quantities of harmful combustion constituents in the exhaust gases generated during combustion of said fuel, said atmosphere comprising a mixture of oxygen and at least a portion of said exhaust gases.

3,905,746
AUTOMATIC EXTINGUISHER FOR CANDLES AND THE LIKE

Michael J. Patrikios, Old Saugatuck Rd., Norwalk, Conn. 06855

Filed Aug. 15, 1973, Ser. No. 388,577
Int. Cl. F23n 5/00
U.S. Cl. 431—35 10 Claims

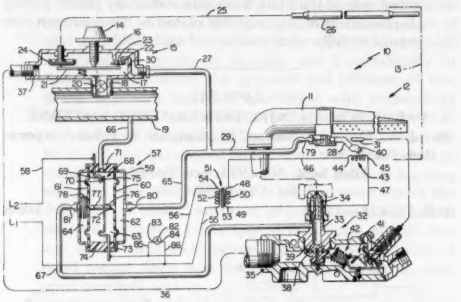


1. In a fuel body containing mechanism the combination comprising:
consumable fuel body means having a mass;
a movable fuel body base means;
an outer sleeve means supporting said fuel body means and open at one end;
power control means connected to said base means;
extinguishing means operable by said control means to extinguish said fuel body means in response to a predetermined degree of consumption of said mass of said consumable fuel body means;
said power control means operative to actuate said extinguishing means a plurality of times automatically.

3,905,747
FUEL CONTROL SYSTEM AND METHOD OF OPERATING THE SAME

Charles D. Branson, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 25, 1974, Ser. No. 445,258
Int. Cl.[2] F23Q 9/08
U.S. Cl. 431—58 32 Claims

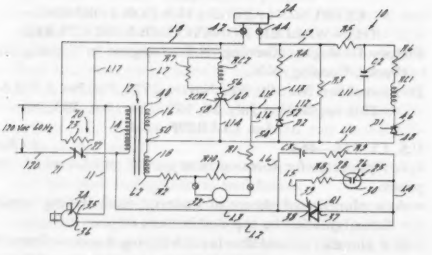


1. In a fuel control system for a main burner means having a pilot burner means therefor and a thermostatically operated control device for directing fuel from a source thereof to said pilot burner means upon the demand of fuel for said main burner means whereby a safety valve will direct fuel from said source to said main burner means only upon the detection of a certain flame means at said pilot burner means, the improvement wherein electrical ignition means is provided for igniting fuel issuing from said pilot burner means, and a condition responsive device is provided for rendering said ignition means operable when fuel is directed to said pilot burner means upon a demand for fuel for said main burner means by said condition responsive device being responsive to said fuel flow to said pilot burner means and for rendering said ignition means inoperable when said safety valve is directing fuel from said source to said main burner means upon a detection thereby of said certain flame means at said pilot burner means by said condition responsive device being responsive to said fuel flow to said main burner means.

3,905,748
PRIMARY CONTROL SYSTEM FOR FURNACES

Anthony C. Cairo, and Ronald E. Holkeboer, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed June 24, 1974, Ser. No. 482,072
Int. Cl. F23n 5/04
U.S. Cl. 431—78 7 Claims



1. In an electrical primary control system for furnaces, the combination including burner control means adapted to be connected to a main line source of AC current, a low voltage control circuit including burner ignition detection means,

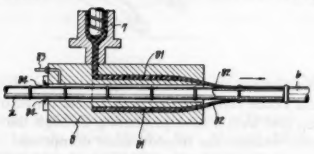
means providing a substantially lower voltage than line voltage in said control circuit, means in said low voltage control circuit including solid state means effective to actuate said burner control means in response to a signal from said ignition detection means, and means interfacing between saaid low voltage control circuit and said burner means, said interfacing means comprising a pair of resilient magnetic contact members disposed in normally spaced overlapping relationship and adapted to make electrical contact therebetween under the influence of magnetic flux, a pair of electrically insulated concentric coils encompassing said contact members, the magnetic flux generated by said coils being additive whereby energization of both of said coils concurrently is effective to move said members into electrically contacting relationship and energization of one of said coils is sufficient to maintain said members in electrically contacting relationship, and a calibrated resistance wire electrically connected in parallel circuit across at least one of said coils.

3,905,749

APPARATUS FOR PREPARING A SYNTHETIC FLOATING PIPE

Todao Suzuki, Toyohashi, and Hiroshi Maruyama, Toyakawa, both of Japan, assignors to Maruhachi Kasei Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 393,190, Aug. 30, 1973. This application Oct. 29, 1974, Ser. No. 518,971
Claims priority, application Japan, Aug. 31, 1972, 27-87673
Int. Cl.² B29D *23/05*
U.S. Cl. 425—113 **2 Claims**



1. An apparatus for forming a synthetic pipe with separating plate therein said apparatus comprising

a. first extruding means for extruding a first pipe;

b. insertion means for inserting said plates into said pipe at predetermined intervals therein;

c. perforation means for perforating the wall of said first pipe between said separation plates said perforation means being positioned such that said perforation is made while said first pipe is still heated and soft from the extrusion thereof;

d. second extrusion means for extruding a second pipe over said first pipe and in contact therewith whereby said perforations are covered and said synthetic pipe is formed thereby.

3,905,750

LANTERN IGNITER

James F. Sell, Rural Rt. 3, P.O. Box 157, Muncie, Ind. 47302

Division of Ser. No. 251,104, May 8, 1972, Pat. No. 3,817,684. This application Apr. 8, 1974, Ser. No. 458,805
Int. Cl.² F23Q *2/00*
U.S. Cl. 431—142 **1 Claim**

1. An igniter for igniting pressurized liquid fuel lanterns and the like comprising:

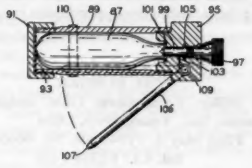
a disposable gas containing cartridge;

a case having a removable end closing portion for containing the disposable cartridge;

manually actuable means for piercing the cartridge and thereafter for selectively allowing gas to escape from the cartridge;

a nozzle having a gas passing orifice in the end thereof and pivotably mounted on the case for pivotable movement between an outwardly extending position and a closed position;

conduit means connecting said nozzle and said cartridge pierced end to thereby allow gas to flow from said cartridge to said nozzle when the manually actuable means



is in its gas passing position; and

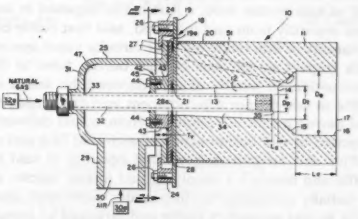
a nozzle spring clip for holding the nozzle in the closed position.

3,905,751

GAS BURNER

Klaus H. Hemsath, Sylvania, Ohio, and Frank J. Vereecke, Palmyra, Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 21, 1974, Ser. No. 453,346
Int. Cl.² F23M *9/00*
U.S. Cl. 431—183 **11 Claims**



1. A gas burner for operation with a mixture of natural gas and oxygen-enriched combustion air, said burner comprising:

a burner block of heat refractory material having an axial tunnel of circular cross section extending therethrough and comprised of a throat section terminating at its downstream end in an abruptly widening flare chamber section flaring out to a diameter appreciably greater than that of said throat section;

a gas nozzle tube of cylindrical outer contour extending axially through said tunnel from the inlet end thereof and in spaced relation to the wall thereof to form therebetween an annular combustion air passageway through the said throat section of the tunnel;

said gas nozzle tube having a nozzle end set back a slight distance upstream from the downstream end of said throat section;

means for supplying gas fuel under a slight positive pressure to the inlet end of said gas nozzle tube;

means for supplying oxygen-enriched combustion air under a slight positive pressure to the inlet end of said annular air passageway;

respective gas and combustion air spin generator means respectively associated with said gas nozzle tube and with said annular combustion air passageway for imparting spinning motion in complementary directions about the tunnel axis to the gas column discharged endwise from said gas nozzle and to the combustion air discharged endwise from said annular air passageway and enveloping the spinning gas column whereby to cause said gas and air columns to spread laterally outward from the tunnel axis on passage through the said flare chamber section of said tunnel and subsequently to be drawn back inwardly toward the tunnel axis to thereby create a gas and air recirculation and flame stabilization zone located entirely

out in space and outwardly removed from the walls of said burner block; and

the ratio of the diameter of the downstream end of said tunnel throat section to the outside diameter of said gas nozzle tube is within the approximate range of 1.9 to 2.2.

3,905,752

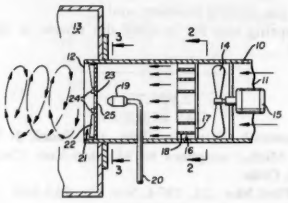
OIL BURNER

William F. Miller, Youngstown, Ohio, assignor to Hy-Way Heat Systems, Inc., Youngstown, Ohio

Filed May 3, 1974, Ser. No. 466,608

Int. Cl.[2] F23M 9/08

U.S. Cl. 431—183 3 Claims



1. An oil burner comprising a burner tube having inlet and outlet ends, means for supplying combustion air to said inlet end of said burner tube, a first baffle disposed in said burner tube inwardly from said inlet end, said first baffle comprising a plurality of thin relatively wide circular vanes spaced radially with respect to the axis of said burner tube to direct said combustion air axially of said burner tube and a secondary baffle in said burner tube adjacent said discharge end thereof and having a central opening therein, a fuel delivering nozzle disposed in said burner tube between said first and secondary baffles and directed toward said opening in said secondary baffle and means for supplying fuel to said nozzle, a plurality of radially extending fan-like blades positioned circumferentially in said secondary baffle and arranged to impart a spiral swirl to the axial flowing air in the burner tube so as to mix the same thoroughly with fuel delivered by said nozzle.

3,905,753

COMPACT BURNER FOR DRYERS

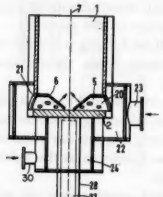
Hilmar Vits, Huschelrath 16, 5672 Leichlingen, Germany

Filed Aug. 27, 1973, Ser. No. 391,767

Claims priority, application Germany, Aug. 26, 1972, 2242037

Int. Cl.[2] F23Q 9/00

U.S. Cl. 431—284 7 Claims



1. A compact burner for dryers having divided fuel-gas and combustion-air channels, a flame-jet and a mixing space which is open in the direction of the flame-jet, the fuel-gas and combustion-air channels communicating with the mixing space by means of a plurality of outlets which are arranged around the central axis of the burner, and an opening in the burner for a pilot-burner, at least two of the combustion-air outlets and at least one of the fuel-gas outlets comprising one unit, the axes of the combustion-air outlets of each unit crossing each other in the mixing space and the axis of the fuel-gas outlet of the same unit lying in the mutual mirror-plane of the axes of the two combustion-air outlets in such a way that the exiting fuel-gas jet mixes with the sequential air jets, the combustion-air outlets being located in the inclined sides of wedge-shaped hollow bodies whose apexes run radially to the burner-axis, and the fuel-gas outlets being arranged in the troughs which are formed by two adjacent hollow bodies.

3,905,754

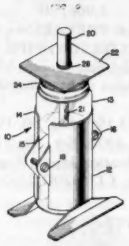
ALCOHOL BURNER CONSTRUCTION

Robert Maddestra, Canton, and David E. Munn, Framingham, both of Mass., assignors to Damon Corporation, Needham Heights, Mass.

Filed Aug. 14, 1974, Ser. No. 497,205

Int. Cl.[2] F23D 3/18

U.S. Cl. 431—324 11 Claims



1. An alcohol burner of the type fabricated from a pharmaceutical bottle having a cap with a heat reflector attached to the cap and with a wick projecting through the cap and heat reflector wherein the improvement comprises:

a pair of shields encompassing a major portion of the outer surface of said bottle, each shield being flared at the bottom to provide a base for the burner to increase the stability of the burner, each shield being made of metal to function as a heat sink for heat generated when the bottle is in use and to retard flying glass in the event of a burner explosion said pair of shields being separated from each other and held about said bottle by connecting means to form a stand for the bottle, the separation between said shields enabling the alcohol level to be viewed when the alcohol level in the bottle falls below the height of the shields, said connecting means enables a friction fit between said shields and the bottle to be maintained, said friction fit holding the bottle firmly in position between said shields while enabling the bottle to be moved up and down in the stand to adjust the height of the burner.

3,905,755

MINIATURE BLOWTORCH

Leonard E. Aske, 5508 Park Ave., Minneapolis, Minn. 55417

Filed Jan. 21, 1974, Ser. No. 434,848

Int. Cl.[2] F23D 13/04, 13/24

U.S. Cl. 431—344 4 Claims

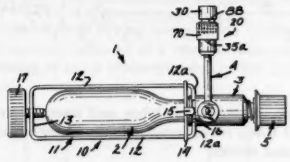
1. A miniature blowtorch apparatus of the type utilizing an attached cylinder of compressed gas in cooperation with a mounting head assembly, wherein the improvements comprise a snap-on cylinder housing for removably positioning the gas cylinder in fixed relationship to the mounting head assembly, said housing comprising:

a. an annular groove formed in the outer surface of the mounting head assembly;

b. a resilient U-shaped frame having two opposed side members and a base member for partially enclosing the sides and bottom of the gas cylinder, said side members each having an inwardly extending end portion opposite said

base member for insertion in said annular groove, said frame side members having a first position in which the end portions are inserted in said annular groove to partially enclose the gas cylinder, and a second position in which said end portions are spread away from the annular groove to thereby disengage said housing from the mounting head assembly;

c. a closure bracket removably positioned around said frame to confine said frame side members in their first



position, said closure bracket being slidably movable on said support frame to allow the frame side members to be moved to their second position, said closure bracket being attachable to the mounting head assembly to thereby hold said closure bracket in place around said frame side members; and

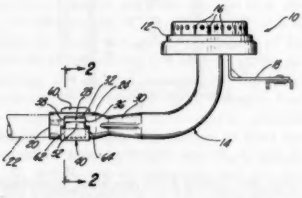
d. a clamping bolt extending through said frame base member and advanceable against the gas cylinder contained between said frame side members to hold it in fixed position.

3,905,756

SHUTTER STRUCTURE AND MIXING TUBE ASSEMBLY FOR GAS BURNER

William J. Ferlin, and Nelson G. Mayer, both of Detroit, Mich., assignors to Lincoln Brass Works, Inc., Detroit, Mich.

Filed May 9, 1974, Ser. No. 468,224
Int. Cl.[2] F23D *13/40*
U.S. Cl. 431—354 **11 Claims**



1. Shutter structure for adjusting the effective size of air inlet porting in a mixing tube for a gas burner, the porting being defined by angularly spaced side edges and axially spaced end edges, said structure comprising,

means forming a generally arcuate band which turns through an angle greater than 180° and which is dimensioned and contoured to be turned in sliding frictional engagement around portions of a mixing tube which define such air inlet porting,

said band having edges which are angularly spaced apart to define at least one open area adjustably registrable with such porting responsive to turning thereof,

stop means extending inwardly adjacent one of said edges of said band, said stop means having first and second surfaces positioned to engage said side edges of such porting to limit turning movements of said band,

said stop means having third and fourth surfaces positioned to engage said end edges to obstruct axial movement of said band on a mixing tube, said stop means comprising hook means, said first and second surfaces comprising interior and exterior portions of said hook means, said third and fourth surfaces comprising end portions of said hook means,

said band being resiliently radially expansible to facilitate snap-over flexing thereof to and from engagement around a mixing tube,

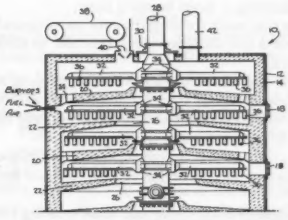
said first and second surfaces being cooperable with a said side edge of such porting to provide an anchor about which said band is pivotable to effect said snap-over flexing, the other of said edges of said band being turned outwardly to provide a finger hold to facilitate pivoting of said band about said anchor.

3,905,757

APPARATUS AND METHOD FOR DISTRIBUTING MATERIAL BEING PROCESSED OVER A FURNACE HEARTH FLOOR

Charles F. von Dreusche, Jr., Ramsey, N.J., assignor to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Continuation-in-part of Ser. No. 362,335, May 21, 1973, Pat. No. 3,834,859. This application July 18, 1974, Ser. No. 489,462
Int. Cl. F27b *1/02*
U.S. Cl. 432—18 **31 Claims**



1. In a furnace having at least a single substantially horizontal hearth, the combination comprising a rotatable center shaft extending up through the center of said hearth, at least one rabble arm secured to the center shaft and extending radially outwardly over said hearth, means for providing a radial flow component of material being processed on said hearth, and independent means for providing a circumferential flow component of the material being processed on said hearth with respect to said means for providing the radial flow component, whereby when said center shaft is rotated the flow of material being processed is distributed across the entire hearth area.

18. A method of processing material in a single hearth furnace having a center shaft extending up through the center of said hearth, at least one rabble arm secured to the center shaft and extending radially outwardly over said hearth, said method comprising the steps of introducing said material onto said hearth, urging said material to move across said hearth with a radial flow component, while simultaneously urging said material to move across said hearth with an independnet circumferential flow component, whereby said material is caused to flow across the entire hearth area without forming stagnant zones.

3,905,758
HEAT TREATMENT TUNNEL KILN FOR PRODUCTS HAVING A CIRCULAR CROSS-SECTION

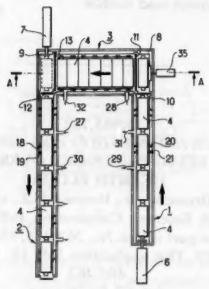
Jean Moussou, Bagneres de Bigorre, and Robert Calvet, Tarbes, both of France, assignors to Ceraver, Paris, France

Filed July 5, 1974, Ser. No. 486,256

Claims priority, application France, July 13, 1973, 73.25851

Int. Cl.[2] F27B *9/02;* **B65H** *51/00*

U.S. Cl. 432—128 **11 Claims**



1. A tunnel kiln comprising:

a. a plurality of cylindrical supports, each of which contains a plurality of cavities shaped to receive objects to be heat treated;

b. means defining a main treating zone;

c. means in said main treating zone for moving said cylindrical supports in a direction perpendicular to their longitudinal axes;

d. means in said main treating zone for rotating said cylindrical support about their longitudinal axes during their translational movement in said main treating zone;

e. means defining a second treating zone;

f. means in said second treating zone for moving said cylindrical support in a direction parallel to their longitudinal axes;

g. a first chamber connecting said main treating zone to said second treating zone, said first chamber being adapted to receive at least one of said cylindrical support at a time; and

h. means for isolating said first chamber in a gas-tight manner from either said main treating zone or said second treating zone.

3,905,759
TUNNEL KILN FOR HEAT TREATMENT OF CYLINDRICAL PRODUCTS

Jean Weber, Tarbes, France, assignor to Ceraver, Paris, France

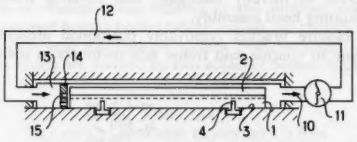
Filed May 3, 1974, Ser. No. 466,661

Claims priority, application France, May 8, 1973, 73.16588

Int. Cl.[2] F27B *9/00*

U.S. Cl. 432—144 **5 Claims**

1. In a tunnel kiln having an elongated tunnel for heat treatment in a controlled atmosphere with re-circulation of gases, of cylindrical products, arranged inside support-tubes and supported thereby, including means for moving the support tubes in the kiln tunnel perpendicular to their longitudinal axis and along a longitudinal path through said elongated tunnel, the improvement comprising: lateral ducts opening up to respective sides of said tunnel and connected by a gas re-circulation duct, means within one of said ducts for sucking gas from one side of said tunnel and discharging gas into said tunnel from the other side thereof, and at least one upright wall member within said tunnel and adjacent the lateral duct discharging re-circulated gas into said kiln with said upright wall member having slots therein at positions corresponding to said tube interiors for causing said re-circulated gas to flow



longitudinally through said tubes and laterally through said kiln as said tubes move longitudinally along a path through said elongated tunnel.

3,905,760
OVEN FOR BAKING FOOD PRODUCTS

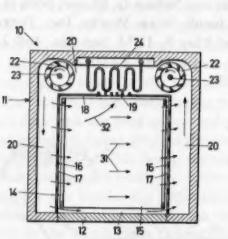
Leif A. T. Johansson, Huddinge, and Nils G. Pers, Upplands Vasby, both of Sweden, assignors to Tipe Revent AB, Stockholm, Sweden

Filed Jan. 18, 1974, Ser. No. 434,681

Claims priority, application Sweden, Jan. 26, 1973, 7301135

Int. Cl.[2] F27B *3/022*

U.S. Cl. 432—176 **6 Claims**



1. An oven for baking food products, comprising:

a. a thermally insulated enclosed housing having a vertical door;

b. first and second opposed apertured vertical side walls extending from said door in horizontally spaced relation to the interior of said housing;

c. a third apertured vertical side wall extending between said first and second side walls in horizontally spaced relation to the interior of said housing, said vertical side walls and said door jointly defining a baking chamber therebetween;

d. a pair of fans of the cross-flow type, one disposed to direct its driven output to the space between said housing and said first vertical side wall, and the other disposed to direct its driven output to the space between said housing and said second vertical side wall, both disposed to have their low pressure side communicate with the space between said housing and said third vertical side wall;

e. a control timer connected to operate said fans singly and jointly; and

f. means in said housing outside said chamber for conditioning air.

3,905,761
COMPOSITION AND METHOD FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

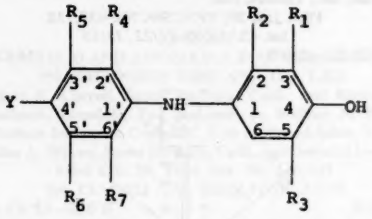
Division of Ser. No. 61,833, Aug. 6, 1970, Pat. No. 3,792,090. This application Oct. 30, 1972, Ser. No. 301,998

Claims priority, application Luxemburg, Aug. 11, 1969, 59265

Int. Cl.[2] A61K *7/13*

U.S. Cl. 8—10.2 **6 Claims**

1. A keratinous fiber dyeing composition consisting essentially of an aqueous solution of a member selected from the group consisting of (a) a diphenylamine of the formula



wherein Y represents a member selected from the group consisting of hydroxy and amino, R_1 and R_3, each independently, represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1–4 carbon atoms, lower alkoxy containing 1–4 carbon atoms, a ureido residue and —NHCOR wherein R represents lower alkyl containing 1–4 carbon atoms, R_2 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1–4 carbon atoms, lower alkoxy containing 1–4 carbon atoms, a ureido residue —NHCOR wherein R represents lower alkyl containing 1–4 carbon atoms and -NHR_8 wherein R_8 represents a member selected from the group consisting of hydrogen, lower alkyl containing 1–4 carbon atoms, lower hydroxy alkyl containing 1–4 carbon atoms and carbamylmethyl, with the proviso that when R_2 is —NHR_8, R_3 is not hydrogen, R_4, R_5, R_6 and R_7 each represent a member selected from the group consisting of hydrogen, halogen, lower alkyl containing 1–4 carbon atoms and lower alkoxy containing 1–4 carbon atoms, with the proviso that when Y is hydroxy, R_2 is not hydrogen, halogen, lower alkyl containing 1–4 carbon atoms or lower alkoxy containing 1–4 carbon atoms, and that when Y is amino, at least two of R_1, R_2 and R_3 are other than hydrogen and R_2 is not hydrogen when R_4, R_5, R_6 and R_7 are all hydrogen; and (b) the hydrochloride of the diphenylamine of (a), said diphenylamine being present in amounts of 0.01 to 0.1 percent by weight of said composition and said composition having a pH between 7 and 10.

3,905,762
PROCESS FOR THE CONTINUOUS, EVEN DYEING OF COTTON PIECE GOODS CONTAINING PORTIONS OF ABNORMAL FIBERS

Armand Lehinant, Offenbach(Main), and Hans-Peter Maier, Sulzbach, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 26, 1972, Ser. No. 318,193

Claims priority, application Germany, Dec. 27, 1971, 2164734

Int. Cl.[2] D06P *1/36*

U.S. Cl. 8—30 **3 Claims**

1. In a process for the continuous level dyeing of cotton piece goods containing portions of abnormal fibers, the improvement, for the purpose of covering these irregularities, which comprises: impregnating the textile material with an alkaline padding liquor which contains carboxymethyl cellulose and a reactive dyestuff or components of azo developing dyestuff; and then, either after fixation of the reactive dyestuff or simultaneously with the completion of development of the azo dyestuff, precipitating the dyed carboxymethyl cellulose on the fiber surface by treating the goods with a solution of a salt or acid salt of a polyvalent metal or a cationic adjuvant containing quaternary ammonium compounds.

3,905,763
PROCESSES FOR TREATING POLYAMIDES

Jean-Paul Dalle, Saint-Quentin, France, assignor to Societe Anonyme dite: Omnium de Prospective Industrielle S.A., Saint-Amand, France

Filed Mar. 14, 1973, Ser. No. 341,291

Claims priority, application France, Mar. 14, 1972, 72.08875

Int. Cl.[2] D06M *3/02, 13/00, 3/00;* **A61K** *7/06*

U.S. Cl. 8—128 R **7 Claims**

1. A process for improving the properties of textiles consisting essentially of natural polyamide fibres, which process comprises contacting the fibres with liquid ammonia at a temperature and for a time whereby their textile properties are improved.

3,905,764
PROCESS AND DEVICE FOR THE WET TREATMENT AND DRYING OF TEXTILE MATERIAL

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schon, all of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 1, 1972, Ser. No. 302,854

Claims priority, application Germany, Mar. 25, 1972, 2214713; Oct. 12, 1972, 2249987; Oct. 12, 1972, 2249950; Oct. 12, 1972, 2249997The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.

Int. Cl.[2] D06C *7/04*

U.S. Cl. 8—140 **15 Claims**

1. A process for rinsing or washing and drying of textile material, comprising treating the material in an aqueous bath, said bath consisting essentially of an aqueous rinse or wash liquid and a burnable organic solvent, and drying and removing the liquid from the material by burning off the organic solvent.

3,905,765
STEAM TREATMENT OF FABRICS

Ian Stockwell Bissitt, Bradford, England, assignor to Wira and Mather & Platt, Ltd., Manchester, England

Filed Sept. 20, 1972, Ser. No. 290,669

Claims priority, application United Kingdom, Sept. 22, 1971, 44119/71

Int. Cl.[2] D06B *3/18*

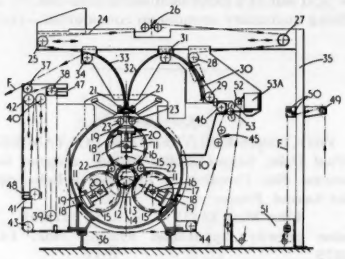
U.S. Cl. 8—149.3 **5 Claims**

2. A method of imparting a durable compression effect to textile material comprising the steps of:

a. placing said textile material between a pair of endless tensioned belts,

b. moving the pair of belts and the textile material along a curved path within a pressurized vessel, to exert a substantially continuous compressive load on the textile material,

c. increasing the compressive load at at least one location along said path, by passing said textile material between at least one nip roller and at least one pressure roller located within said pressurized vessel, and



d. steaming the textile material at a temperature greater than 100°C during at least a portion of its travel through the pressurized vessel.

3,905,766

METHOD FOR THE LIQUID TREATMENT OF, PRIMARILY, CELLULOSIC PULP

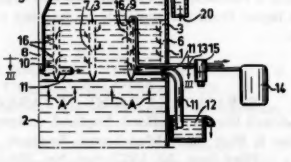
Bengt Edvard Petterson, Sundsbruk, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Continuation of Ser. No. 850,923, Aug. 18, 1969, abandoned. This application June 3, 1974, Ser. No. 476,076

Claims priority, application Sweden, Sept. 18, 1968, 12572/68

Int. Cl.² D21D *5/02*

U.S. Cl. 8—156 **2 Claims**



1. In a method for withdrawing of liquid from a fibrous material suspended in a liquid and fed through a generally upright container, in the axial direction of said container, said container being, in the part where the withdrawal is carried out, filled with the suspension, involving the steps of flowing the liquid towards at least one chamber for collecting withdrawn liquid, said chamber being positioned within the suspension and said chamber having a pervious wall, subjecting said pervious wall to the action of pressure variations which at least partially interrupt the influx of withdrawn liquid into said collecting chamber, thereby preventing the clogging of the pervious wall of the collecting chamber and facilitating the travel of material past or along said surface, the improvement which consists in producing said pressure variations through the intermediary of a gas, said gas being transmitted through a conduit into the top of the collecting chamber and being subjected to pressure impulses, free passage of said gas being maintained in said conduit and in the top of said chamber thereby obtaining rapid transmission of the pressure impulses to the surface of liquid collected in said collecting chamber.

3,905,767

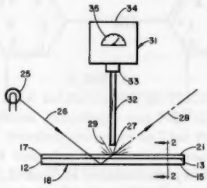
PROCESS FOR QUALITATIVE ANALYSIS OR QUANTITATION OF ANTIGENS OR ANTIBODIES

David Alexander Nathaniel Morris, Elkhart, and Melvin Dee Smith, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 30, 1974, Ser. No. 437,732

Int. Cl.² G01N *21/22, 33/16*

U.S. Cl. 23—230 B **14 Claims**



1. A process for rapid qualitative analysis and/or quantitation of antigens or antibodies with an antigen-antibody reaction in which a precipitate is formed, the process comprising contacting a surface of a gel having a first reagent which includes an antigen or an antibody incorporated in at least a surface part thereof with a second reagent which includes an antigen or an antibody and which is reactive with said first reagent to form a precipitate which remains in a surface portion of said gel,

projecting a light beam through said surface portion of said gel,

measuring the extent to which said light beam is scattered by said precipitate, and

correlating the extent to which said light beam is scattered to analytical data sought.

3,905,768

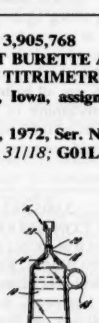
DISPOSABLE WEIGHT BURETTE AND METHOD FOR CARRYING OUT TITRIMETRIC ANALYSES

Clifford C. Hach, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Filed Aug. 29, 1972, Ser. No. 284,655

Int. Cl.² G01N *31/16, 31/18;* **G01L** *3/02;* **B65D** *37/00*

U.S. Cl. 23—230 R **10 Claims**



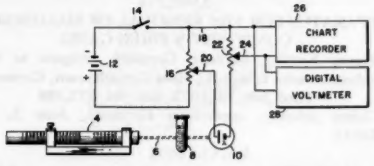
10. A method of conducting a titrimetric analysis to quantitatively determine the presence of an unknown which com-

prises providing a sample solution of known volume containing the unknown, introducing an indicator for the analysis into the sample solution in an amount sufficient to allow the endpoint of the titrimetric analysis to be determined, providing a disposable weight burette including a flexible, impermeable capsule having an orifice of from about 0.01 to about 0.03 inch in diameter and a titrant for the unknown contained within the capsule and having a known weight standardization equivalent for the unknown and a unit weight of titrant, weighing the disposable weight burette, expressing sufficient titrant from the disposable weight burette into the sample solution to reach the endpoint, reweighing the disposable weight burette and quantitatively determining the amount of the unknown by comparing, in view of the volume of the sample solution, the weight of titrant used to reach the endpoint and the weight standardization equivalent for the unknown.

3,905,769
METHOD AND APPARATUS FOR MEASURING PROTHROMBIN TIME AND THE LIKE

Wallace E. Carroll, Santa Barbara, Calif., and Richard D. Jackson, Lansdale, Pa., assignors to Wallace E. Bagley; Wallace Industries Company, both of Philadelphia, Pa. and Alan A. Wilcox, Santa Barbara, Calif., part interest to each

Filed Feb. 28, 1974, Ser. No. 446,941
Int. Cl.[2] G01J *1/42*; **G01N** *21/24, 33/16*
U.S. Cl. 23—230 B **8 Claims**



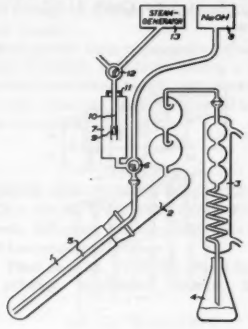
1. A method for determining the coagulation characteristics of analytical body fluid samples by measuring the optical density of the samples comprising: directing a light beam from a light source through the analytical fluid sample, receiving the light from said source after it passes through the sample and generating an electrical output the amplitude of which throughout substantially the entire range of transmittance of the light from the source is approximately proportional to the sum of a constant and the logarithm of the transmittance; and subtracting said output from a first value and multiplying the result by a second value to obtain a final result.

3,905,770
APPARATUS FOR USE IN DETERMINATION OF NITROGEN BY THE KJELDAHL METHOD

Leif Roger Mossberg, Asmundtorp, Sweden, assignor to Tecator Instrument AB, Helsingborg, Sweden

Filed Sept. 7, 1973, Ser. No. 395,141
Claims priority, application Sweden, Sept. 15, 1972, 11920/72
Int. Cl. G01n *31/00*
U.S. Cl. 23—253 R **4 Claims**

1. An apparatus for use in determining nitrogen according to the Kjeldahl method, designed for alkalizing an acid digest resulting from acid digestion and for removing resulting ammonia by means of steam distillation, said apparatus comprising a distillation vessel containing said acid digest, a condenser and a receiver connected with said distillation vessel, an alkali storage container, a dosing container for alkali adapted for dosing and measuring alkali and for discharging alkali from said storage container into said distillation vessel, a first 3-way valve allowing flow of alkali from said dosing container to said distillation vessel when set in a first position and adapted for establishing communication between said alkali storage container and said dosing container when set in a second position, a supply of steam, means for connecting said steam to said distillation vessel and said dosing container, a second 3-way valve communicating said steam to said dosing container

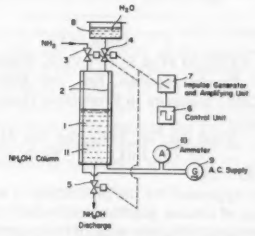


when set in a first position and communicating with the atmosphere when set in a second position and a float valve within said dosing container for controlling the level of alkali into said dosing container.

3,905,771
APPARATUS FOR MEASURING THE DISSOCIATION RATIO OF AMMONIA

Vasile Sandor, and Zoltan Kolozsvari, both of Tirgu Mures, Romania, assignors to Intreprinderea Industriala de Stat Methalothehnica, Tirgu Mures, Romania

Filed Apr. 16, 1973, Ser. No. 351,340
Int. Cl.[2] G01N *27/56, 27/30, 27/06*
U.S. Cl. 23—254 E **5 Claims**



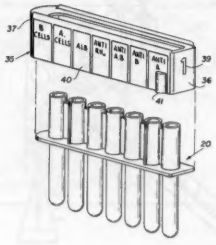
1. Apparatus for measuring the dissociation ratio of ammonia comprising a cell, two spaced electrodes in said cell, means to introduce into the cell a quantity of water proportional to the portion of the introduced ammonia that remains undissociated upon the contact of the ammonia with the water to form in said cell a column of ammonium hydroxide whose height is indicative of such undissociated portion, a source of electric current, means to connect said electrodes to said current source to subject the electrodes to respectively opposite polarities, and means to measure the intensity of current flow between the electrodes through the column of ammonium hydroxide in the cell, whereby said intensity is proportional to the undissociated portion of the ammonia.

3,905,772

APPARATUS FOR PERFORMING BLOOD TYPING TESTS

John J. Hartnett, Yonkers; Jules Barry Cohen, Brooklyn, and Emil A. Scordato, Bronxville, all of N.Y., assignors to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Filed July 5, 1973, Ser. No. 376,590
Int. Cl.[2] B01L *3/14*; G01N *31/00, 33/16*
U.S. Cl. 23—259 12 Claims



1. In a testing apparatus for determining the blood group of a patient's blood, the combination of a plurality of separate test tube like elements each being capable of holding a liquid sample, said elements being linearly arranged and joined together to form a single unitary multiple receptacle member having separate chambers for directly receiving blood component samples to be tested, and a thin walled, flattened tubular indicia member having two parallel sidewalls joined by end walls and open at top and bottom and adapted to surround the upper portion of said multiple receptacle member, said indicia member being further adapted to be removably attached to said multiple receptacle member to form an integral test unit, said indicia member having a depth from top to bottom sufficient to be marked adjacent each test tube like element with a legend indicative of the reagent to be added to that element in conducting a blood group test, whereby after a test is completed the test unit can be readily separated and the multiple receptacle member discarded while said indicia member is available for use on another multiple receptacle member.

3,905,773

SYSTEM FOR SUPPLYING INERT GAS

Walter G. Brooks, Houston, Tex., and John P. Knodle, Ventura, Calif., assignors to Production Operators, Inc., Houston, Tex.

Filed Dec. 26, 1972, Ser. No. 318,396
Int. Cl.[2] B01J *7/00*; F01N *3/15*
U.S. Cl. 23—281 5 Claims

1. In an apparatus for the production of an inert gas by the conversion of exhaust gas from an internal combustion engine said apparatus having a source of hydrocarbon fuel of predetermined BTU value connected to said engine by a fuel supply means, and exhaust duct means connected to said engine to convey the exhaust gases therefrom; and a catalytic converter provided in said duct means for reacting the exhaust gases over a catalyst of the group consisting of platinum and palladium, the improvement comprising:

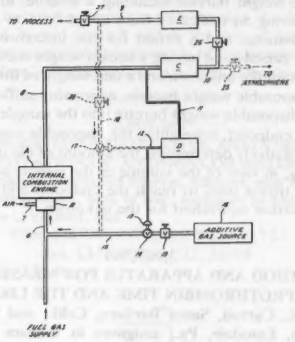
a. Exhaust gas analyzing means connected to said duct means between said engine and said converter to sample and respond to the chemical composition of the exhaust gas;

b. A source of fuel additive of BTU value differing from that of the hydrocarbon fuel;

c. A connection between said latter source of fuel additive and said fuel supply means;

d. A valve controlling said connection; and

e. An operative connection between said analyzing means and said valve for adjusting the quantity of fuel additive admixed with said hydrocarbon fuel supplied to the engine in proportions which will maintain the combustibles



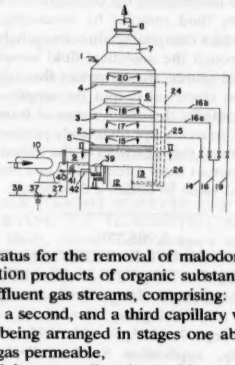
in the exhaust gas at a level sufficient for efficient operation of the catalytic converter.

3,905,774

APPARATUS FOR THE REMOVAL OF MALODOROUS COMPONENTS FROM GASES

Wölfgang Kotting, Koblenz, Germany, assignor to Steuler Industriewerke G.m.b.H., Hohr-Grenzhausen, Germany

Filed July 20, 1972, Ser. No. 273,398
Claims priority, application Germany, June 2, 1972, 2226955
Int. Cl.[2] B01J *10/00*
U.S. Cl. 23—283 6 Claims



1. Apparatus for the removal of malodorous components, decomposition products of organic substantances in particular, from effluent gas streams, comprising:

a. a first, a second, and a third capillary washing plate, the plates being arranged in stages one above another, and being gas permeable,

b. a conduit surrounding the washing plates and confining the flow of an effluent gas stream to a path through the plates,

c. an inlet on the conduit adapted to admit the effluent gas stream into the conduit below the first plate,

d. a discharge outlet on the conduit adapted to exhaust the effluent gas stream from the conduit above the third plate,

e. a first pool of a washing fluid containing approximately 2 to 6 percent of a solute chosen from the group consisting of sodium hydroxide, potassium hydroxide, and mixtures thereof, positioned on the first plate, the plate and pool defining a first washing stage,

f. a second pool of washing fluid containing approximately 3 to 8 percent solution of solute chosen from the group consisting of sodium hydroxide, potassium hydroxide,

and mixtures thereof, positioned on the second plate, the plate and pool defining a second washing stage,

g. a third pool of a washing fluid containing approximately 0.5 to 8 percent sulfamic acid (NH_2SO_3H), positioned on the third plate, the plate and pool defining a third washing stage,

h. means for directing the stream upwardly through the plates and pools,

i. injecting means adapted to inject chlorine into the stream before the stream passes through the plates and pools,

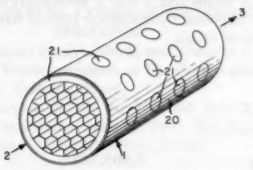
j. control means responsive to the proportion of components in the stream that can be oxidized with chlorine, to control the amount of chlorine injected into the stream, and

k. level means associated with each plate to control the quantity of washing fluid on each plate.

3,905,775
MODULE

Donald Maurice Sowards, Claymont, and Richard N. Watson, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 12, 1972, Ser. No. 314,328
Int. Cl.² B01J *8/00;* **F16L** *9/14*
U.S. Cl. 23—288 FC **13 Claims**



1. A module which comprises a casing having an inlet and an outlet face and an interior and exterior surface, said interior surface of the casing having some physical or mechanical means to which a rigid transition refractory cement can be anchored, a monolith within said casing and having at least one longitudinal and transverse axis, which monolith allows substantially unobstructed flow between the inlet and outlet faces of the casing, a rigid transition refractory cement anchored to the interior surface of the casing and to the outer periphery of the monolith, the materials of construction of said monolith and said rigid transition refractory cement being such that the lowest compressive strength of the monolith measured perpendicular to a longitudinal axis being greater than the compressive strength of the transition refractory cement.

4. The module of claim 1 wherein the monolith is coated with a catalyst for the treatment of a fluid.

3,905,776
METHOD OF MAKING A THIN, FERRO-MAGNETIC MEMORY LAYER AND ARTICLE MADE THEREBY

Kenneth E. Long, Cleveland Heights, Ohio, and David W. Taylor, Edgemont, Pa., assignors to Nico Magnetics, Inc., Wilmington, Del.

Filed July 5, 1973, Ser. No. 376,856
Int. Cl.² C25D *3/12;* **B23P** *3/00;* **G11C** *11/02, 11/04*
U.S. Cl. 29—183.5 **6 Claims**

1. The method of electrodepositing a thin ferro-magnetic cobalt layer, having a nominal coercivity between about 200 oersteds and 500 oersteds, upon a conductive copper base, said layer composed of hexagonal crystals of cobalt and having a thickness of between about 4 and about 20 microinches, comprising:

a. Preparing an aqueous electroplating bath consisting of cobalt chloride buffered with a low molecular weight carboxylic acid selected from the group consisting of monochloro acetic acid, acetic acid, diglycolic acid, and malonic acid in a pH range of between about 3.5 and 5.8, and

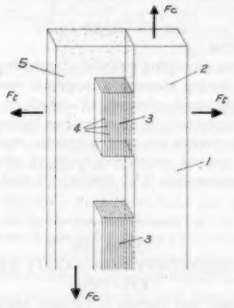
b. Plating the cobalt onto the copper-base submerged in the bath while maintaining the bath at a temperature of between 18°C and about 24°C said plating conducted at a current density of at least 90 amps per square foot using a cobalt anode.

6. A ferro-magnetic layer composed of close packed hexagonal crystals of cobalt, said layer having a thickness of between about four and about twenty microinches and deposited on a conductive substrate from the aqueous bath according to the method of claim 1.

3,905,777
COMPOSITE AND POROUS METALLIC MEMBERS WHICH CAN BE USED FOR BONE PROSTHESIS

Roger Lacroix, Suresnes, France, assignor to Comptoir Lyon-Alemand-Louyot, Paris, France

Filed Jan. 28, 1974, Ser. No. 436,850
Claims priority, application France, Jan. 31, 1973, 73.03415
Int. Cl.² B21D *39/00*
U.S. Cl. 29—183.5 **10 Claims**



1. A composite metallic member comprising

a core, and

a porous covering welded to the core, said covering having a thickness between 5 and 50% of the maximum transverse dimension of the core and said covering comprising a plurality of layers of foil, the foil having a thickness between 0.05 and 0.5mm. and having perforations, the covering being formed by welding the foil layers so that the perforations together form passages of which the minimum transverse dimension is at least 50 microns.

3,905,778
MIRROR WITH OPTICALLY POLISHED SURFACE

Robert C. Pearson, Annapolis, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 1, 1973, Ser. No. 384,655
Int. Cl.² B23P *3/00;* **B32B** *3/00;* **C25D** *7/08*
U.S. Cl. 29—191 **4 Claims**

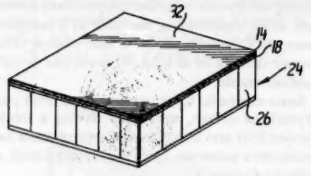
1. A mirror element comprising:

a. a base structure;

b. a first layer of a suitable reflective material having a first optically flat surface and a second surface rough with respect to said first surface; and

c. a second layer of adhesive material for securing said first layer of reflective material to said base structure, said adhesive material having a coefficient of thermal expansion sufficiently similar to that of said base structure and said first layer to prevent stresses from distorting said first optically flat surface;

d. said first layer including a plurality of solid particles dispersed in said first layer adjacent said second, rough



surface and being of sufficient size to provide said second surface with a roughness whereby said first layer adheres to said second layer.

3,905,779

MAGNETIC RECORDING BODY

Eiichi Tadokoro, and Masashi Aonuma, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Nov. 16, 1973, Ser. No. 416,545

Claims priority, application Japan, Nov. 16, 1972, 47-115371

Int. Cl.[2] B32B *15/20*

U.S. Cl. 29—194 **8 Claims**

1. A magnetic recording element comprising a nonmagnetic base support having thereon a magnetic recording medium layer composed predominantly of cobalt or a cobalt-nickel alloy, a first protecting layer of copper having a thickness of less than 0.2 micron on said magnetic recording medium layer, and a second protecting layer of rhodium having a thickness of more than 0.01 micron on said first protecting layer.

3,905,780

OXIDATION-RESISTANT LOW ALLOY STEEL WITH AL COATING

Joseph C. Jasper, and Marvin B. Pierson, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed June 25, 1973, Ser. No. 373,278

Int. Cl. B32b *15/00*

U.S. Cl. 29—196.2 **5 Claims**

1. An article having good oxidation resistance at elevated temperature, good resistance against attack by hydrocarbon combustion products at elevated temperature, good formability, and high strength, said article consisting of an outer layer applied by hot dip coating chosen from the class consisting of aluminum, and aluminum alloys, and a ferritic substrate consisting essentially of, by weight percent, from about 0.01 percent to about 0.13 percent carbon, from about 0.5 percent to about 3 percent chromium, from about 0.8 percent to about 3 percent aluminum, from about 0.4 percent to about 1.5 percent silicon, from about 0.1 percent to about 0.6 percent manganese, from about 0.1 percent to about 1 percent titanium, and remainder iron except for incidental impurities.

3,905,781

CARBURETOR DETERGENT AND CORROSION INHIBITING MOTOR FUEL COMPOSITIONS

Peter Dorn, Lagrangeville, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 301,905

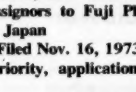
Int. Cl. C10l *1/22*

U.S. Cl. 44—71 **14 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing from about 0.0005 to 0.1 weight percent of an alkenyl succinamic acid represented by the formula:

in which R is an aliphatic hydrocarbon radical having from about 12 to 20 carbon atoms and X and Y alternately represent hydrogen and an aliphatic hydrocarbon radical having from about 6 to 16 carbon atoms.

14. A method for preventing the build-up of carburetor deposits in an internal combustion gasoline engine which comprises supplying to and burning in said engine a motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing from about 0.0005 to 0.1 weight percent of an alkenyl succinamic acid represented by the formula:



in which R is an aliphatic hydrocarbon having from about 12 to 20 carbon atoms and X and Y alternately represent hydrogen and an aliphatic hydrocarbon radical having from about 6 to 16 carbon atoms.

3,905,782

ODOR INHIBITION FOR PARAFFIN HYDROCARBONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 14, 1973, Ser. No. 359,790

Int. Cl. C10l *1/18*

U.S. Cl. 44—78 **4 Claims**

1. An odor stabilized composition of matter consisting essentially of a major proportion of at least one paraffin hydrocarbon having a normal boiling point within the range of from about 70°F to about 700°F, a minor proportion of oxidizable, unsaturated hydrocarbon impurities and an oxidation stabilizing amount of bis(3,5-di-tert-butyl-4-hydroxybenzyl) ether.

3,905,783

METHOD OF PURIFYING AN AIR OR GAS FLOW OF VAPOROUS OR GASEOUS IMPURITIES ADSORBABLE IN FILTERS

Karl Winter, Dortmund-Solde, and Gunter Staschik, Halingen, both of Germany, assignors to Ceag Dominit, Aktiengesellschaft, Dortmund, Germany

Filed June 22, 1973, Ser. No. 372,628

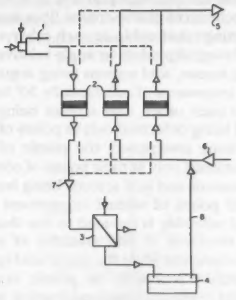
Claims priority, application Germany, June 28, 1972, 2231640

Int. Cl. B01d *53/04*

U.S. Cl. 55—31 **5 Claims**

1. Method of purifying an air or gas flow of vaporous or gaseous impurities adsorbable in filters which comprises passing the flow through an adsorption filter for purifying the flow, passing a counter-flow of an inert gas formed from the combustion of at least one of carbon, coke and a hydrocarbon substance through the adsorption filter after it has attained a predetermined loading of the impurities so as to desorb the

adsorption filter, cooling the inert gas laden with the desorbed impurities so as to condense the desorbed impurities, and then



separating the condensed desorbed impurities together with condensed water from the remainder of the inert gas flow.

3,905,784

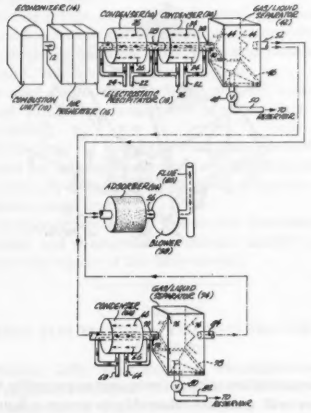
METHOD FOR REMOVING POLLUTANTS FROM COMBUSTION PRODUCTS GENERATED BY HYDROCARBON FUEL COMBUSTION, AND SYSTEM THEREFOR

Raymond L. Kelleher; Ivan A. Shirk, and Timothy J. O'Leary, all of Spokane, Wash., assignors to The Corporation of Gonzaga University, Spokane, Wash.

Continuation-in-part of Ser. No. 788,460, Jan. 2, 1969, abandoned. This application June 29, 1971, Ser. No. 157,952

Int. Cl.[2] B01D *53/04, 53/00*

U.S. Cl. 55—31 **13 Claims**



1. The method of generating and treating combustion product type industrial exhaust gases to remove water soluble atmosphere pollutants therefrom, said method comprising:

a. generating the exhaust gases under conditions evolving the products in hot gaseous form;

b. cooling the hot combustion products to about 35°F. at substantially atmospheric pressure to condense the contained water and convert water soluble pollutants including any formaldehyde, formic acid, hydrogen sulfide, sulfur dioxide, oxides of nitrogen, quinoline bases and pyridine bases to aqueous liquid phase as solutes in the condensed water;

c. separating the condensed water and its solutes from the remaining gases; and

d. discharging at least most of the remaining gases to the atmosphere.

3,905,785

SPRAY BOOTH BOTTOM COLLECTOR

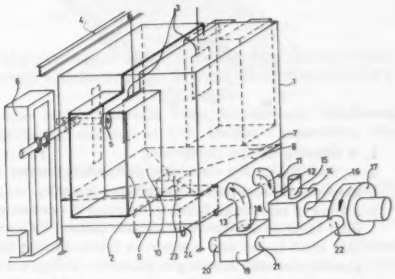
Pierre Fabre, Grenoble, France, assignor to Air Industrie, Courbevoie, France

Filed Apr. 2, 1973, Ser. No. 346,844

Claims priority, application France, Apr. 27, 1972, 72.15586

Int. Cl. B01d *46/04*

U.S. Cl. 55—96 **23 Claims**



1. A method of creating a sub-atmospheric pressure in a chamber for electrostatically depositing powder on articles therewithin, and for recovering unused surplus powder in said chamber through an opening in the bottom of said chamber, which method comprises the steps of cyclically and alternately applying to said chamber, through at least one inclined air-permeable plate which constitutes at least part of the bottom of said chamber and slopes downwardly toward said opening, outward suction for a relatively long period of time sufficient to maintain a sub-atmospheric pressure within said chamber substantially throughout its operation, and then inward gaseous pressure for a relatively short period of time sufficient to loosen any powder which has fallen onto said inclined plate so that said powder will slide down said plate and out of said chamber through said opening.

3,905,786

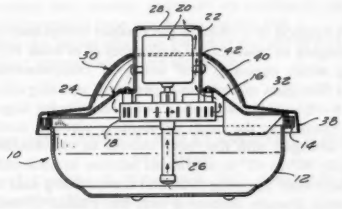
HUMIDIFIER FILTER

Gary D. Jorgensen, Appleton, Wis., assignor to Albany International Corporation, Albany, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,502

Int. Cl.[2] B01D *47/00*

U.S. Cl. 55—230 **4 Claims**

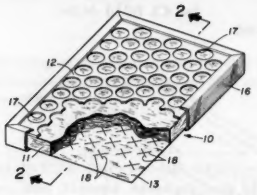


1. In combination:

1. a humidifier of the canister type, said humidifier having a generally round top portion, a droplet outlet extending through said top portion and an air inlet extending through said top portion and

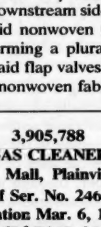
2. a one-piece integral filter formed of molded fibrous material disposed over said top portion covering said air inlet but not said droplet outlet.

3,905,787
FILTER
Fred S. Roth, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 23, 1974, Ser. No. 535,327
Int. Cl.² B01D 25/02
U.S. Cl. 55—488 4 Claims



1. A filtering device, comprising
a. a filter layer for removing particulate matter from a gaseous medium passed therethrough, and
b. a layer of nonwoven fabric positioned in contact with the filter layer on the downstream side thereof for supporting said filter layer, said nonwoven fabric having therein a plurality of slits forming a plurality of flap valves, the combined area of said flap valves being 35 to 60 percent of the area of said nonwoven fabric.

3,905,788
GAS CLEANER
Howard Alliger, 38 E. Mall, Plainview, N.Y. 11803
Continuation-in-part of Ser. No. 246,065, April 20, 1972, abandoned. This application Mar. 6, 1974, Ser. No. 448,516
Int. Cl.² B01D 25/22
U.S. Cl. 55—489 4 Claims



1. A method of making a gas cleaner comprising the steps of arranging an assembly of a plurality of at least 100 screens having mesh openings and being of compressible plastic coated fiberglass material in superposed abutting relationship to each other with the mesh of the screens being aligned at an angle relative to the mesh of abutting screens, said screens being arranged with the mesh thereof at increments of substantially 30° to 45° in alignment relative to each other, then simultaneously applying heat and compressing said assembly of screens thereby flattening only the plastic of each of the screens only at their points of contact with the other abutting screens and completely bonding said screens to each other at all their points of mutual engagement and reducing the thickness of said assembly to less than 40 percent of the original thickness of said assembly of screens while not reducing substantially the size of said openings and deforming the plastic coating ot said fiberglass material to prestress said fiberglass material so that said gas cleaner will resist distortion upon fluid flow.

4. A gas cleaner comprising a plurality of at least 100 completely bonded screens of plastic coated fiberglass arranged in superposed abutting relationship to each other with the mesh of said screens being aligned at an angle relative to the mesh of each abutting screen, said screens being arranged with the mesh thereof at increments of substantially 30° to 45° in alignment relative to each other, said screens being compressed under stress and being deformed only at points of contact with said fiberglass being prestressed, the plastic of each of the screens being flattened only at their points of contact with the other abutting screens and said screens being bonded to each other at all their points of mutual engagement whereby the thickness of said assembly is reduced to less than 40 percent of the original thickness of said assembly of screens while prior to being compressed while the size of said openings is not reduced substantially and with the plastic coating of said fiberglass material being deformed to prestress said fiberglass material so that said gas cleaner will resist distortion upon fluid flow.

3,905,789
EVAPORATOR COIL ASSEMBLY FITTING MOUNT
Charlie P. Carpenter, Elyria, Ohio, assignor to The Tappan Company, Mansfield, Ohio
Filed Mar. 20, 1974, Ser. No. 452,939
Int. Cl.² F25D 19/00
U.S. Cl. 62—299 8 Claims

1. In combination with an evaporator assembly having an evaporator coil, a mount releasably to secure a liquid or suction line of the evaporator coil to the evaporator assembly comprising an adaptor fitting in such line having a body portion which is provided with at least one groove, a mounting bracket secured to the evaporator assembly having an aperture therein through which the body portion of the adaptor fitting extends, and an anchor plate having a slot defining side edges at least one of which may be slidingly received in the body groove, and fastening means selectively to secure said anchor plate to one side of said mounting bracket when said side edge of the slot of the anchor plate is received in said body groove to tightly secure such fitting and line to the assembly positively to preclude axial displacement and rotation of the same when said anchor plate is secured to said mounting bracket.

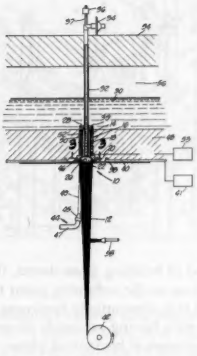
3,905,790
METHOD AND APPARATUS FOR MANUFACTURING GLASS FIBERS

Edward T. Strickland, P.O. Box 6529, San Diego, Calif. 92106

Continuation-in-part of Ser. No. 432,897, Jan. 14, 1974, abandoned. This application Aug. 26, 1974, Ser. No. 500,303

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **30 Claims**



1. A method of forming glass fibers which comprises:

a. passing separate streams of molten glass through an orifice plate heated by orifice plate heating means, said orifice plate having at least four rows of orifices therein, with orifices being spaced in flooding relationship;

b. drawing fibers from cones of molten glass formed at each said orifice; and

c. directing a bulk flow of rapidly moving gas upwardly to the orifice area in said plate, said bulk flow being a generally single gas column at the cone and plate area, in an amount, velocity and angle sufficient:

i. to cool said cones to provide a stable cone formation and to maintain separation of cones thus preventing flooding;

ii. to impinge on said plate essentially to eliminate stagnant gas adjacent said plate and to cause gas to move outwardly along said plate in all directions from said orifice area; and

iii. to supply a source of gas sucked downwardly by the fibers and substantially eliminate ambient gas drawn into the region of the fiber cones.

3,905,791
METHOD FOR MAKING COLORED TRANSPARENT ARTICLES

Emile Plumat, Gilly; Jean Schottey, Montignies-sur-Sambre, and Francois Toussaint, Montignies-le-Tilleul, all of Belgium, assignors to Glaverble-Mecaniver, Watermael-Boitsfort, Belgium

Filed Mar. 28, 1974, Ser. No. 455,952

Claims priority, application Luxemburg, Apr. 2, 1973, 67338

Int. Cl.² C03C *17/26*

U.S. Cl. 65—30 **18 Claims**

1. In a process of forming a glass body from a vitrifiable batch and modifying the color of such body by causing a substance to diffuse into surface layers of the glass body from a contacting treatment medium, the improvement comprising: introducing a reducing agent into the surface of the body; providing a treatment medium composed of at least one salt yielding reducible silver ions capable of being reduced by the reducing agent, and a diluting agent constituted by one or more salts of a metal other than silver; introducing into the medium a substance which influences the electrical potential of the medium to bring such potential to a selected value in the range between −600 and +300 mV relative to a reference potential; monitoring the value of the electrical potential of the medium; varying the concentration of such substance in the medium, whenever the potential value measured during said monitoring step deviates from said selected value, in a direction to return the value of the reference potential to said selected value; contacting the body into which such reducing agent has been introduced with such medium for a predetermined time while maintaining the electrical potential of said medium in such range and while maintaining temperature conditions such that reducible silver ions diffuse from the medium into the body and at least some of such ions are reduced in the body by the reducing agent.

3,905,792
METHOD OF MANUFACTURING SEMI-CONDUCTING GLASSES EXHIBITING ELECTRICAL CONDUCTIVITY IN THE MASS

Hendrikus Johan Lodewijk Trap, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,914

Claims priority, application France, Mar. 21, 1973, 73.10147

Int. Cl.² C03B *23/20;* **C03C** *15/00*

U.S. Cl. 65—18 **8 Claims**

1. A method of manufacturing semi-conducting glasses exhibiting conductivity in the mass comprising the steps of:

providing conventional reducible glasses from a glass forming mixture consisting essentially of at least one network forming oxide and at least one network modifying oxide, said glasses having constituent compounds proportionately selected from the group consisting essentially of SiO_2, PbO, B_2O_3, As_2O_3, MgO, ZnO, Li_2O, Na_2O, Al_2O_3, CaO and Fe_2O_3;

grinding said glasses in a preselected manner to a powder; sieving out from said powder a grain fraction having a predetermined size limitation;

subjecting said powder grains to a reducible gas for a predetermined time and temperature; and

melting the grains after the action of the gas at a predetermined temperature in an atmosphere.

5. A method of manufacturing semi-conducting glasses exhibiting conductivity in the mass comprising the steps of:

providing conventional oxidizable glasses from a glass forming mixture consisting essentially of at least one network-forming oxide and at least one network modifying oxide, said glasses having constituent compounds proportionately selected from the group consisting essentially of SiO_2, Al_2O_3, MnO, Li_2O, Na_2O and As_2O_5;

grinding said glasses in a preselected manner to a powder; sieving out from said powder a grain fraction having a predetermined size limitation;

subjecting said powder grains to an oxidizable gas for a predetermined time and temperature; and

melting the grains after the action of the gas at a predetermined temperature in an atmosphere.

3,905,793
COMPUTER CONTROL FOR GLASSWARE FORMING MACHINE

William J. Croughwell, Wilmington, N.C., assignor to Emhart Corporation, Hartford, Conn.

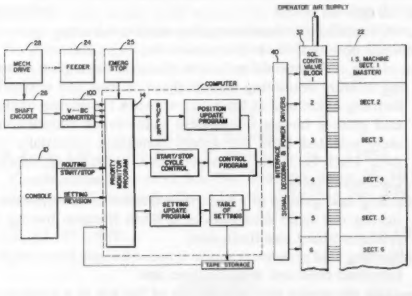
Filed Oct. 21, 1974, Ser. No. 516,424

Int. Cl.² C03B *7/00, 9/18, 9/40*

U.S. Cl. 65—163 **9 Claims**

1. In a multi-section glassware forming machine, each of which sections includes at least the following mechanical means:

a. means for delivering gobs of molten glass to a blank station in the machine section at a rate which can be varied,
b. a blank mold operable to and from an active position at the blank station,
c. a split neck ring mold operable between open and closed positions and cooperating with the blank mold to define a parison cavity at the blank station,
d. means for settling the gob into the neck mold at said blank station, and a plunger operable to and from an active position at the blank station,
e. secondary parison mold defining means operable to and from an active position at said blank station, and cooperating with said blank mold to define said parison cavity,
f. transfer means for moving said split neck molds and the parison formed in said cavity out of said blank station and into a blow station,
g. a split blow mold operable between open and closed positions at said blow station,
h. means for final forming the parison at said blow station,
i. take-out means for removing the final blown article from said blow station, said machine being further characterized by the improvement comprising:
j. drive means for said gob delivery means, and including a position indicator shaft so geared to said drive means as to make one revolution between delivery of succeeding gobs to said blank station associated with one of said individual machine sections,

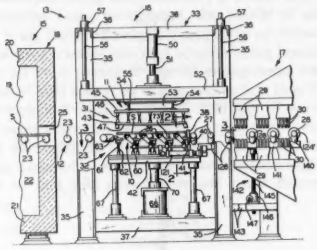


k. electromechanical transducer means driven by said position indicator shaft for generating a variable electrical output voltage indicative of the angular position of the said shaft,
l. converter means for said transducer output voltage to generate a coded digital signal indicative of the instantaneous position of said shaft in binary coded decimal form,
m. digital computer means including accessible memory means,
n. comparator means for continuously comparing said digital shaft position signal to a preprogrammed value stored in said computer memory means in order to provide a first signal when said shaft position is equal to or greater than its programmed value and providing a second signal when said shaft position is equal to or less than its programmed value,
o. said computer memory means including means for storing a programmed value of said shaft position corresponding to a desired sequence in event timing of the operation of each of said mechanical mechanisms,
p. manually operable means by which the machine operator can select other values of shaft position for certain boundary even timings, other event timings being preprogrammed to occur at predetermined shaft displacement therefrom, and said manually operable means being permitted only during a succeeding cycle of operation of the machine, and only when the value so selected is within a predetermined interval also preprogrammed in said digital computer means.

3,905,794
GLASS SHEET SUPPORTING, SHAPING AND CONVEYING APPARATUS

Robert G. Revells; Donald D. Rahrig, both of Toledo, and Floyd T. Hagedorn, Oregon, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 17, 1974, Ser. No. 515,488
Int. Cl.² C03B *23/02*
U.S. Cl. 65—106 **18 Claims**



1. In a method of bending glass sheets, the steps of heating a flat sheet of glass to the softening point thereof, supporting the heated sheet in a substantially horizontal plane on a plurality of conveyor rolls having arcuately shaped supporting portions lying in a common horizontal plane, rotating said conveyor rolls to advance said heated sheet into a position above a lower press member having an upwardly facing shaping surface, moving said shaping surface upwardly to engage the marginal edges of said sheet to lift said sheet and initiate a bending cycle while swinging said conveyor roll supporting portions downwardly at angular attitudes relative to said common plane out of engagement with said sheet to preclude relative frictional movement therebetween.

5. In apparatus for the horizontal bending of glass sheets, a frame, a bending member mounted on said frame and having an upwardly facing shaping surface formed thereon, a plurality of rotatable conveyor rolls mounted on said frame for supporting a glass sheet above said shaping surface in position to be engaged thereby, and means for moving said bending member upwardly to engage the marginal edges of said sheet and lift the same from said conveyor rolls into pressing engagement with an upper complemental bending member; the improvement wherein said conveyor rolls are provided with arcuately shaped central portions, and means for pivoting said conveyor rolls to displace said central portions of said rolls from a common plane supporting said glass sheet prior to bending to angular positions disengaging said roll central portions from said glass sheet upon engagement of said press member shaping surface with said sheet marginal edges during upward movement of said bending member.

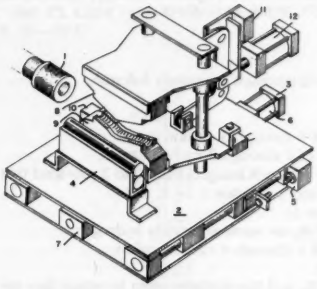
3,905,795
APPARATUS FOR MAKING HIGH INTENSITY DISCHARGE ARC TUBE

William A. Finch, Marblehead; Frederick A. Loughridge, Ipswich, and Rudolf Marcucci, Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Aug. 22, 1973, Ser. No. 390,538
Int. Cl.² C03B *23/14*
U.S. Cl. 65—279 **1 Claim**

1. Apparatus for the manufacture of arc tubes for high intensity discharge lamps comprising: means for holding and rotating a length of vitreous quartz tubing; a heater for heating an intermediate portion of the quartz tubing to a temperature of at least about 1,800°C, said heater being mounted on a slidable support, said heater in its heating position being proximate said intermediate portion of quartz tubing; a closable two piece mold mounted on said slidable support; means for rapidly moving said slidable support, upon attainment by said

intermediate portion of quartz tubing of said temperature, so as to move said heater away from its position proximate said intermediate portion of quartz tubing and to move said two piece mold into position proximate said intermediate portion



of quartz tubing; means for closing said two piece mold on said intermediate portion of quartz tubing; and means for introducing pressurized gas into the interior of the quartz tubing and forming said intermediate portion into the mold shape in less than one second after removal of the heater.

3,905,796

PROCESS FOR THE DEHYDRATION AND GRANULATION OF MANURE-BASE FERTILIZERS

Giovanni Ghelfi, Uster, Switzerland, assignor to Intereko S.A., Switzerland

Filed July 9, 1973, Ser. No. 377,275

Claims priority, application Switzerland, July 13, 1972, 10489/72

Int. Cl.[2] C05F *3/00*

U.S. Cl. 71—21 7 Claims

1. A process for dehydration of manure-based fertilizers, comprising;

subjecting a manure-based material to treatment to obtain a homogeneous and durable pulp;

granulating said pulp; and

drying the resulting granules during at least two drying periods separated by a rest period enabling (1) removal of superficial water from each granule during the first drying period, (2) homogenizing the resulting moisture content of outer and inner layers of each granule during said rest period and, (3) final drying of the granules.

3,905,797

ALGAECIDE AND HERBICIDE COMPOSITION

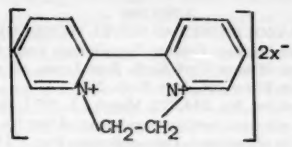
Donald H. Kunkel, R[1] No. 2, Box 9, Eagle, Wis. 53119, and Donald E. Seymour, 2608 E. Newton Ave., Milwaukee, Wis. 53211

Continuation of Ser. No. 76,218, Sept. 28, 1970, abandoned. This application Mar. 19, 1973, Ser. No. 342,738

Int. Cl.[2] A01N *13/00*

U.S. Cl. 71—66 3 Claims

1. A synergistic algaecide and herbicide composition, comprising an aqueous solution containing a water soluble complex produced by reacting a water-soluble salt selected from the group consisting of cobalt salts and copper salts with an alkanolamine, said alkanolamine including at least one alkanol group containing from 1 to 10 carbon atoms, said aqueous solution also containing a water-soluble compound having the formula:



where X is an anionic radical selected from the group consisting of chloride, bromide, iodide, fluoride, p-toluene sulfonate, and mixtures thereof, said complex being presented in a proportion of about 1% to 90% by weight of the total weight of said complex and said compound, said compound being present in the proportion of about 90% to 1% by weight of the total weight of said complex and said compound.

3,905,798

PLANT GROWTH REGULATORS

Bernd Zeeh, Ludwigshafen; Johann Jung, Limburgerhof; Costin Rentzea, Heidelberg, and Karl-Heinz Koenig, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 1, 1973, Ser. No. 328,645

Claims priority, application Germany, Feb. 18, 1972, 2207575

Int. Cl.[2] A01N *9/14*

U.S. Cl. 71—76 2 Claims

1. A process for stunting crop plant growth which comprises applying to the host soil for said crop plants a plant growth stunting amount in the range of 0.5 to 8 kg. per hectare of a member selected from the group consisting of 1,1-dimethyl-3,4-dehydropiperidinium bromide, 4-chloro-1,1-dimethylpiperidinium bromide, 1,1-dimethylhexahydropyridazinium bromide, and 1,1-dimethylpiperidinium chloride.

3,905,799

2-CHLOROETHYLPHOSPHONODITHIOATE ESTERS

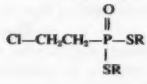
David I. Randall, and Robert W. Wynn, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 875,574, Nov. 10, 1969, Pat. No. 3,838,180. This application Jan. 17, 1972, Ser. No. 218,527The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—87 13 Claims

1. A plant growth regulating composition far increasing fruiting in plants which comprises an inert carrier and a plant growth regulating amount of an ester of 2-chloroethylphosphonodithioic acid of the formula:



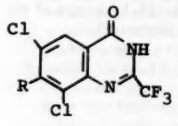
wherein R is alkyl of one to two carbon atoms, haloalkyl of one to two carbon atoms, aryl of six to 12 carbon atoms, halosubstituted aryl of six to 12 carbon atoms, alkyl-substituted aryl of six to 12 carbon atoms wherein the alkyl group contains one to seven carbon atoms or aralkyl of seven to 12 carbon atoms and mixtures of said esters.

3,905,800
QUINAZOLINONES AS NOVEL HERBICIDES

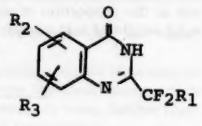
Beryl William Dominy, Groton; Hans-Jurgen Ernst Hess, Old Lyme, and Richard Carl Koch, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 234,372, March 13, 1972, Pat. No. 3,840,540, which is a continuation-in-part of Ser. No. 54,618, July 13, 1970, abandoned. This application Dec. 7, 1973, Ser. No. 422,970
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 9 Claims

1. A method of inhibiting the growth of weeds which comprises treating with a herbicidal amount of a compound selected from the group having the formulae



and



I II

and the alkali metal and alkylamine salts thereof, wherein:

R is selected from the group consisting of Cl, CH_3, CH_3O, carbamyl and mono- and dialkylcarbamyl wherein each said alkyl contains from 1 to 3 carbon atoms;

R_1 is selected from the group consisting of H, F, Cl, perfluoroalkyl containing from 2 to 4 carbon atoms and –CXYZ wherein X, Y and Z are each selected from the group consisting of H, F, and Cl;

R_2 is selected from the group consisting of H, F, Cl, Br, I, CH_3 and CF_3; and

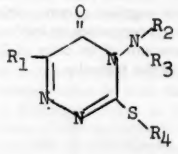
R_3 is selected from the group consisting of H, F, Cl, Br and NO_2.

3,905,801
SUBSTITUTED 1,2,4-TRIAZINE-5-ONES AS HERBICIDES

Maged M. Fawzi, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

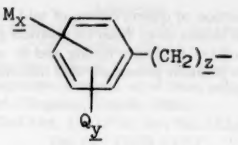
Filed Nov. 28, 1966, Ser. No. 597,836
Int. Cl.² A01N 9/22
U.S. Cl. 71—93 6 Claims

1. A method of controlling undesired vegetation comprising apply ing to a locus to be protected a herbicidal amount of com ound of the formula



wherein

R_1 is hydrogen,
alkyl of 1 through 8 carbon atoms,
naphthyl,
benzyl,
phenyl, or



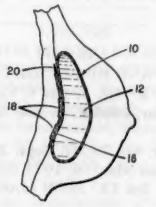
wherein

M and Q are each separately halogen,
nitro,
cyano,
alkyl of 1 through 3 carbon atoms, or
alkoxy of 1 through 3 carbon atoms,
x and y are each integers from 0 to 2 provided that the sum of x and y is either 1 or 2, and
z is 0 or 1;
R_2 and R_3 are each separately hydrogen,
alkyl of 1 through 4 carbon atoms,
phenyl,
or R_2, R_3 and the nitrogen atom to which they are bonded taken together form morpholino, piperidino or pyrrolidino; and
R_4 is alkyl of 1 through 4 carbon atoms,
benzyl,
allyl,
carboalkoxy of 2 through 4 carbon atoms, or carboalkoxy alkyl of 3 through 4 carbon atoms.

3,905,802
SEPARATION OF SOLID METAL IMPURITIES FROM ZINC SULPHATE SOLUTIONS

Ivan Kostadinov Stoilov; Pencho Ivanov Ralchev; Georgi Nikolov Korudanov; Lyuben Rangelov Starev; Ivaylo Yanev Grigorov; Todor Vassilev Shikov; Kiril Spassov Kirev; Ivan Zahariev Zashev; Yovko Nikolov Yovkov, all of Plovdiv; Kostadin Dimitrov Apostolov, Village Krumova; Georgi Iliev Ivanov, and Stoycho Ivanov Mutafchiev, both of Assenovgrad, all of Bulgaria, assignors to DSO "Metalurgia i Rudodobiv", Sofia, Bulgaria

Filed May 15, 1974, Ser. No. 470,298
Claims priority, application Bulgaria, May 15, 1973, 23601
Int. Cl.² C01G 9/06
U.S. Cl. 75—120 3 Claims



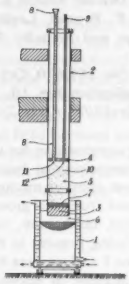
1. A method for the continuous separation of the solid phase in the purification of zinc sulphate solutions comprising filtering the solutions in chamber disc filters under an elevated pressure up to 4 atm.

3,905,803

PROCESS FOR PRODUCING INGOTS BY ELECTRIC RESISTANCE MELTING PARTICULATE METAL UNDER SLAG

Paolo Bianchi; Aldo Ramacciotti, and Eugenio Repetto, all of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Nov. 27, 1973, Ser. No. 419,380
Claims priority, application Italy, Dec. 6, 1972, 54535/72
Int. Cl. C22d 7/00; H05b 7/18; B22d 27/02
U.S. Cl. 75—10 C 10 Claims



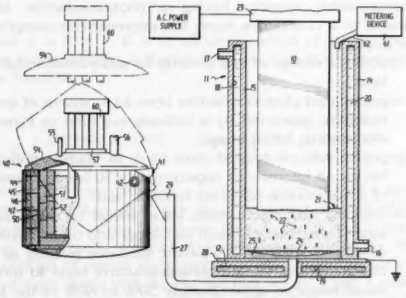
1. An ESR process for producing metal alloy ingots by melting under electro-conductive slag, comprising establishing in an electro-conductive mold a quantity of slag, introducing into said mold a hollow consumable metal electrode having a closed bottom immersed in said slag, introducing particulate metal into said hollow electrode, establishing an inert gas atmosphere in said hollow electrode, passing an electric current through said electrode and mold to melt said closed end of the electrode and to sinter said particulate metal adjacent said end of the electrode to form a sintered layer having a thickness sufficient to support the weight of the superposed particulate metal, and supplying further particulate metal to the interior of said electrode while continuing to pass said electric current thereby progressively to melt said particulate metal and said electrode and progressively to build a said ingot in said mold.

3,905,804

METHOD OF DECARBURIZATION OF SLAG IN THE ELECTROSLAG REMELTING PROCESS

William W. Scott, Jr., Parkesburg, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Filed June 7, 1973, Ser. No. 367,941
Int. Cl.² C21C 05/54
U.S. Cl. 75—11 28 Claims



1. An electroslag remelting process which comprises:

melting of slag in a furnace by means of at least one graphite electrode whereby the carbon content of the molten slag is increased;

transferring said molten slag into the bottom of an electroslag remelting mold wherein an ingot of improved homogeneity is formed by the continued melting of a metal consumable electrode the end portion of said electrode being immersed in said molten slag whereby melted metal from said end portion falls through said molten slag and solidifies to form said ingot in said mold while an electrical current passes through said slag between said electrode and said ingot being formed for maintaining said slag in a molten condition; and

introducing an oxidizing agent into said molten slag in said mold while said current is passing therethrough, the amount and rate of said introduction of said oxidizing agent being such as to perform the function of removing carbon from said molten slag without causing excessive foaming of said slag.

3,905,805

RECYCLING OF FERROMANGANESE PRECIPITATOR DUSTS

Kenneth A. Schowalter, and Richard H. Hunter, both of Monroeville Borough, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 12, 1973, Ser. No. 396,639
Int. Cl.² C22B 7/02
U.S. Cl. 75—25 6 Claims

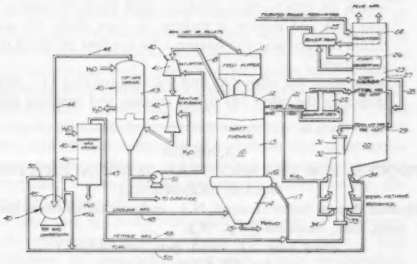
1. Method of preparing ferromanganese blast furnace dust for recharging into the ferromanganese blast furnace comprising treating ferromanganese dust containing sodium and potassium ions with an ammonium chloride solution for a period of 10 to 180 minutes at a temperature between 0° and 100° C. in order to remove the sodium and potassium, and separating the remaining solids from the solution.

3,905,806

METHOD FOR THE DIRECT REDUCTION OF IRON ORES

Clyde L. Cruse, Jr., and Arthur P. Kerschbaum, both of Middletown, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Feb. 20, 1973, Ser. No. 333,673
Int. Cl. C21b 13/02
U.S. Cl. 75—35 8 Claims



1. A process for the gaseous reduction of sized iron ores, comprising the steps of:

a. generating a reducing gas atmosphere by reforming a feed mixture consisting of a hydrocarbonaceous fluid and steam in the presence of a nickel catalyst at a temperature of about 700° to about 980°C, the molar ratio of steam:-carbon in the feed mixture ranging from about 0.9:1 to about 1.8:1, under conditions such that said reducing gas atmosphere as generated consists essentially of about 85 to about 98 percent hydrogen and carbon monoxide by

volume, and about 1 to about 14 percent water vapor by volume, the hydrogen:carbon monoxide volume ratio being at least 2:1;

b. transferring said reducing gas atmosphere generated in step (a) directly to a reducing portion of a shaft furnace containing said sized ores;

c. subjecting said ores to gaseous reduction in said reducing portion of said shaft furnace at a temperature of about 650° to about 930°C in said reducing gas atmosphere;

d. withdrawing said gas atmosphere from a top section of said shaft furnace after reduction of said ores by said atmosphere;

e. cleaning, cooling and drying the withdrawn top gas;

f. compressing a portion only of the cleaned and cooled top gas to a pressure greater than the pressure in said shaft furnace; and

g. passing said reduced ores into a cooling portion of said shaft furnace, thereby cooling the ores to below reoxidation temperature, and removing the cooled, reduced ores from said furnace.

3,905,807
RECOVERY OF TIN FROM SLAGS

John Millice Floyd, Glen Waverley, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Continuation-in-part of Ser. No. 276,052, July 28, 1972, abandoned. This application Aug. 22, 1974, Ser. No. 499,644

Claims priority, application Australia, July 30, 1971, 5733/71

Int. Cl.[2] C22B *25/00*

U.S. Cl. 75—85 **10 Claims**

1. A method of producing tin from a low grade tin concentrate comprising:

a. melting and partially reducing a mixture of the concentrate and a flux to form a liquid concentrate slag (i) having a Sn content of from about 20 - 50 percent;

b. mixing and reacting the liquid concentrate slag (i) with a liquid tin-iron alloy (ii) having an Fe content of about 10–60 percent to produce a liquid crude tin metal product (iii) of about 0.1 - 2 percent Fe content and a liquid intermediate slag (iv) of about 10 - 40% Sn content;

c. separating the metal product (iii) and the intermediate slag (iv);

d. injecting into the liquid intermediate slag (iv) a reducing material selected from the group consisting of hydrogen, hydrogen-containing gases, hydrogen-producing gases and solid carbonaceous and liquid hydrocarbon materials which on combustion produce such gases to reduce the slag (iv) and reform a molten tin-iron alloy (ii) and a liquid discard slag (v) having a Sn content of about 0.5 – 2 percent;

e. separating the alloy (ii) and the discard slag (v); and

f. recycling the alloy (ii) to the mixing and reacting step.

3,905,808
PROCESS FOR THE RECOVERY OF METALLICS FROM BRASS SKIMMINGS

Hyman Bzura, South Orange, N.J., assignor to Madison Industries, Inc., Madison Twp., N.J.

Filed Mar. 21, 1973, Ser. No. 343,603

Int. Cl. C22b *19/34*

U.S. Cl. 75—101 R **25 Claims**

1. Method of recovering metallics and useful by-products from a solidified mass of brass-skimmings which contain zinc oxide as a significant contaminant, comprising the steps of crushing said mass to loosen and to expose the zinc oxide from the metallics thereof, adding said crushed mass to a reaction zone, adding hydrochloric or sulfuric acid to said reaction zone, mixing said mass and said acid in said reaction zone, separating out undissolved said metallic solids from said reaction zone, withdrawing from the reaction zone the solution of zinc salts resulting from reaction of the acid with the zinc oxide, the addition to the reaction zone of said acid relative to said crushed mass being at a rate and ratio to ensure that enough acid is present and at a strength to react with substantially all the zinc oxide and to react therewith rapidly enough such that the removal of said metallics from said reaction zone can be and is accomplished before essentially any dissolving of said metallics by said acid has occurred.

3,905,809
ALLOY FOR MAKING DUCTILE IRON

Andrew B. Malizio, Delran; Martin A. Rice, Florence, both of N.J., and Harry F. Brooks, Levittown, Pa., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Division of Ser. No. 189,670, Oct. 15, 1971, Pat. No. 3,799,767. This application Jan. 18, 1974, Ser. No. 434,403

Int. Cl. C22c *33/00;* **C21c** *7/00;* **C22c** *37/02*

U.S. Cl. 75—134 S **4 Claims**

1. A nodularizing composition for use in the production of nodular cast iron comprising at least two nodularizing elements in a silicon-iron alloy or mixture of silicon-iron alloys, said elements selected from the group consisting of magnesium, cerium, yttrium, lanthanum, neodymium and praseodymium with each being present in the alloy or alloys in an amount of from about 1 to 3 percent by weight of the composition and the total amount of nodularizing elements in the composition not exceeding more than about 12 percent.

3,905,810
ARTICLE FORMED OF AN ALUMINIUM BRONZE

Norman Coupe Ashton, Huddersfield, England, assignor to N. C. Ashton Limited, Yorkshire, England

Filed Sept. 6, 1973, Ser. No. 394,624

Int. Cl. C22c *9/00, 9/02;* **F16b** *35/00*

U.S. Cl. 75—154 **5 Claims**

1. An integral screw threaded securing member such as a bolt or set screw having increased resistance to stress corrosion in open air and other corrosive environments formed from an aluminum bronze alloy consisting by weight of about 5 to 8% aluminum, up to about 0.5% iron, about 0.1 to 0.25% tin and/or silver, the balance being copper and any impurities.

3,905,811
ELECTROPHOTOGRAPHY USING CRT EXPOSURE AND LIQUID DEVELOPER

Koichiro Fujioka, and Takeo Tano, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1973, Ser. No. 411,199

Claims priority, application Japan, Feb. 8, 1973, 48-15944

Int. Cl. G03g *13/10, 13/22, 13/04*

U.S. Cl. 96—1 LY **4 Claims**

1. In a method for forming an electrostatic image on a photosensitive member having a photoconductive layer bonded to a conductive layer, the improvement comprising the steps of:

applying a charge of one polarity to said photoconductive layer;

exposing said photoconductive layer to a pattern of image radiation generated by a cathode ray tube to form an electrostatic latent image;

exposing said photoconductive layer to blanket radiation having an intensity of approximately 30 lux for a period of 5 lux seconds to 20 lux seconds; and

developing said electrostatic latent image by using liquid toner comprised of liquid developer and toner having a density of .12% to .2% having the same polarity as the charge applied to said photoconductive layer to form a visual image in approximately 50% to 60% of the time normally encountered through the use of a cathode ray tube exposure source.

3,905,812

IMAGING PROCESS

Lee B. Harris, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 23, 1973, Ser. No. 353,837
Int. Cl.² G03G *13/24*
U.S. Cl. 96—1.3 18 Claims

1. A method for photoelectrophoretic imaging which comprises the steps of:

a. providing a layer of an imaging suspension comprising electrically photosensitive particles in an insulating carrier liquid on a first member;
b. forming a liquid nip of said imaging suspension between said first member and a second nip forming member;
c. exposing said suspension ahead of said nip to a pattern of electromagnetic radiation to which at least a portion of said particles are responsive, wherein the suspension within the nip is not exposed to said radiation; and
d. applying an electrical field between said first and second members whereby there is formed on the surface of each member an image which is the reverse in image sense of the pattern of radiation to which the suspension was exposed.

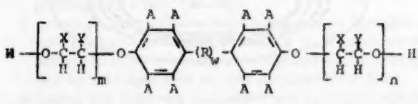
3,905,813

LOW WEIGHT PHOTOCONDUCTIVE COMPOSITIONS

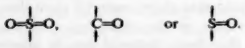
John R. Wyhof, Newark, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed May 21, 1973, Ser. No. 362,541
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 11 Claims

1. A photoconductive composition comprising a photoconductive pigment and an electrically insulating polyester resin in a weight ratio of from about 0.5:1 to 1:1 respectively, wherein said polyester resin is a resin of a polyol comprising an etherified diphenol represented by the formula



wherein *w* is 0 or 1, R is an alkylene radical of one to five carbon atoms, oxygen, sulfur or a divalent radical represented by the formula



A is either a halogen atom or a hydrogen atom, *m* and *n* are integers from 0 through 6 with the proviso that the sum of *n* and *m* is at least about 2 and less than 7, and X and Y are radicals individually selected from the group consisting of alkyl radicals of one to three carbon atoms, phenyl radicals, and hydrogen atoms with the proviso that in any X and Y pair on adjacent carbon atoms, either X or Y is hydrogen; and a dicarboxylic acid, wherein the ratio of carboxyl groups to hydroxyl groups is about unity.

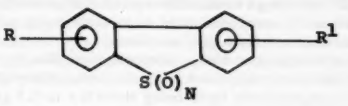
3,905,814

DIBENZOTHIOPHENE OXIDE OR DIOXIDE SENSITIZERS FOR ORGANIC PHOTOCONDUCTORS

Gerardus J. Crommentuyn, Lottum; Joannes A. Hagendoorn, and Hendrik Knibbe, both of Venlo, all of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Sept. 5, 1973, Ser. No. 394,458
Claims priority, application Netherlands, Sept. 15, 1972, 7212511
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.5 15 Claims

1. Electrophotographic reproduction element comprising a support having thereon a photoconductive coating layer containing an organic photoconductive compound that is an electron donor and an organic electron acceptor that forms a donor-acceptor complex with said donor, said acceptor being present in a ratio of between 0.001 and 1 mol thereof per mol of said donor calculated as a monomer, and being a compound of the formula



in which $n = 1$ or 2 and R and R^1, which may be the same or different, each represents one or more hydrogen atoms or one or more substituents selected from the group consisting of halogen atoms and nitro and cyano groups and at least one of R and R^1 represents one or more of said substituents.

3,905,815

PHOTOPOLYMERIZABLE SHEET MATERIAL WITH DIAZO RESIN LAYER

James A. Bonham, Pine Springs, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 209,137, Dec. 17, 1971, abandoned.
This application Dec. 5, 1973, Ser. No. 422,083
Int. Cl.² G03F *7/08*, *7/10*; G03C *1/54*
U.S. Cl. 96—68 9 Claims

1. A light-sensitive sheet useful as a presensitized lithographic plate comprising:

a. a base sheet having at least one permanently hydrophilic, passivated surface;
b. a thin, continuous light-sensitive diazo resin layer overlying said hydrophilic surface; said diazo resin layer being about 1 to 20 mg/ft² and being a condensation product of an aldehyde and a diazonium compound, said diazo resin being soluble in aqueous-based developing solutions;
c. a continuous non-tacky, photopolymerizable layer over said diazo resin layer and in direct contact therewith, said photopolymerizable layer being about 0.1 to 1.5 gram/ft², said photopolymerizable layer having a cure rate at least as great as the rate of insolubilization of said diazo resin upon exposure to actinic radiation and said photopolymerizable layer comprising a film-forming polymeric binder having dispersed therethrough:
   i. at least one normally non-volatile acrylate or methacrylate monomeric compound capable of forming a high polymer by free-radical initiated, chain propagating, addition polymerization, said compound having at least two sites of ethylenic unsaturation, and
   ii. a photoinitiator which comprises a photolyzable s-triazine having at least one trihalomethyl group and at least one chromophoric moiety conjugated with the triazine ring by ethylenic unsaturation, said photoinitiator being normally non-reactive in said layer but which, upon absorption of actinic radiation, is capable of generating free radicals;

wherein said binder represents about 20 to 80 weight percent of said photopolymerizable layer, said monomeric compound represents about 20 to 80 percent of said photopolymerizable

layer, and said photoinitiator is present in an amount of about 0.05 to 10 percent based on the total weight of said monomeric compound; wherein upon image-wise exposure of said light-sensitive sheet to actinic radiation said diazo resin, in exposed areas, becomes insolubilized and said photopolymerizable layer, in exposed areas, becomes an ink-receptive layer which is oleophilic, hydrophobic, water-insoluble, solvent-resistant and tough; and wherein said diazo resin, in exposed areas, is firmly bonded to said hydrophilic surface and to said ink-receptive layer; and wherein the unexposed areas of said diazo resin and said photopolymerizable layer are readily removable from said hydrophilic surface and from adjacent areas of exposed diazo resin and exposed photopolymerizable layer with aqueous-based developing solution.

6. A light-sensitive sheet useful in color proofing comprising:

a. a dimensionally stable, colorless, transparent base sheet;

b. a thin, continuous light-sensitive diazo resin layer overlying said base sheet; said diazo resin layer being about 1 to 20 mg/ft² and being a condensation product of an aldehyde and a diazonium compound, said diazo resin being soluble in aqueous-based developing solutions;

c. a continuous, non-tacky, photopolymerizable layer over said diazo resin layer and in direct contact therewith, said photopolymerizable layer being about 0.1 to 0.5 gram/ft², said photopolymerizable layer having a cure rate at least as great as the rate of insolubilization of said diazo resin upon exposure to actinic radiation and said photopolymerizable layer comprising a film-forming polymeric binder having dispersed therethrough:

i. at least one normally non-volatile acrylate or methacrylate monomeric compound capable of forming a high polymer by free-radical initiated, chain propagating, addition polymerization, said compound having at least two sites of ethylenic unsaturation, and

ii. a photoinitiator which comprises a photolyzable s-triazine having at least one trihalomethyl group and at least one chromophoric moiety conjugated with the triazine ring by ethylenic unsaturation, said photoinitiator being normally non-reactive in said layer but which, upon absorption of actinic radiation, is capable of generating free radicals;

wherein said binder represents about 20 to 80 weight percent of said photopolymerizable layer, said monomeric compound represents about 20 to 80 percent of said photopolymerizable layer, and said photoinitiator is present in an amount of about 0.05 to 10 percent based on the total weight of said monomeric compound; wherein upon image-wise exposure of said light-sensitive sheet to actinic radiation said diazo resin, in exposed areas, becomes insolubilized and said photopolymerizable layer, in exposed areas, becomes an ink-receptive layer which is oleophilic, hydrophobic, water-insoluble, solvent-resistant and tough; and wherein said diazo resin, in exposed areas, is firmly bonded to said base sheet and to said ink-receptive layer; and wherein the unexposed areas of said diazo resin and said photopolymerizable layer are readily removable from said base sheet and from adjacent areas of exposed diazo resin and exposed photopolymerizable layer with aqueous-based developing solution.

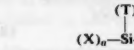
3,905,816
PREPARING LITHOGRAPHIC PLATES UTILIZING HYDROLYZABLE AZO AND AZIDO-SILANE COMPOUNDS

Harold Boardman, Chadds Ford, Pa., and Richard L. Wagner, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

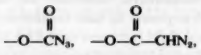
Filed June 27, 1974, Ser. No. 483,855
Int. Cl.² G03F 7/02
U.S. Cl. 96—33 **7 Claims**

1. A process for preparing a lithographic printing plate which comprises the following steps:

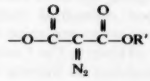
a. photografting imagewise to an oleophilic organic polymer substrate a hydrolyzable azo- or azidosilane compound having the general formula



where R is an organic radical, X is selected from mono and dialkylamino, alkyl and aryl amido, alkoxy, aryloxy and alkyl and aryl oxycarbonyl radicals; T is selected from alkyl, cycloalkyl, aryl, alkaryl, and aralkyl radicals and the corresponding halogenated radicals; *a* is an integer from 1 to 3; *b* is an integer from 0 to 2; *c* is an integer from 1 to 3; and *a*+*b*+*c* equals 4; and Z is selected from



and



where R′ is selected from alkyl, cycloalkyl, aryl, alkaryl and aralkyl radicals;

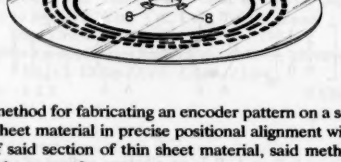
b. washing away non-photografted azo- or azido-silane compound from unexposed areas; and

c. amplifying the hydrophilicity of the hydrolyzed silane groups by treating with at least one amplifying agent selected from soluble silicate solutions and colloidal silica dispersions.

3,905,817
METHOD OF MANUFACTURING A THIN ENCODER DISC

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Aug. 6, 1973, Ser. No. 386,107
Int. Cl.² C23F 1/02
U.S. Cl. 96—36 **13 Claims**



1. A method for fabricating an encoder pattern on a section of thin sheet material in precise positional alignment with the edges of said section of thin sheet material, said method including the steps of:

coating a layer of resist on opposite surfaces of a thin sheet of material;

forming a pattern of apertures in said resist layers on the surfaces of said thin sheet material such that a first portion of apertures in the resist layer on each opposite surfaces of the sheet material are in alignment and a second portion of apertures are formed in the resist layer on only one surface of the thin sheet material;

coating a material layer sufficient for use in encoder scales onto the entire surface of the resist layer including the first and second portions of apertures on said one surface of the thin sheet material;

coating a layer of etch-resistant material onto the layer of encoder scale material in those areas of said one surface where the layer of encoder scale material overlies said second portion of apertures;

selectively etching the exposed portions of the layer of encoder scale material;

selectively etching through said thin sheet material in the region exposed by the first portion of apertures to separate said section;

removing the etch-resistant material from said section; and removing the remaining portions of said resist from said section.

3,905,818

METHOD OF MAKING PRINTED CIRCUITS

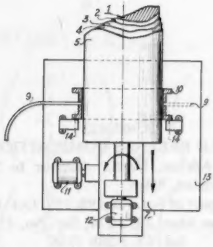
Pierre Margrain, Malakoff, France, assignor to Etablissements E. Ragonot, Malakoff, France

Filed Mar. 8, 1972, Ser. No. 232,731

Claims priority, application France, Mar. 9, 1971, 71.08091

Int. Cl.² G03C *5/00*

U.S. Cl. 96—36.2 **9 Claims**



1. In a method of making a printed circuit, including the successive steps of (a) exposing to actinic light according to the pattern of said circuit, portions of a photosensitive film deposited on a metal layer supported by an insulating base, (b) removing those portions of said film from said metal layer that are separable therefrom subsequent to step (a), (c) etching away those portions of said metal layer that are exposed as a result of step (b) and (d) removing those portions of said film that protected portions of said metal layer during step (c), said last-named portions of said metal layer constituting the conductors of said printed circuit, the improvement in step (a) comprising the steps of:

A. causing at least one actinic light spot to impinge on said photosensitive film;

B. causing a relative movement between said light spot and said photosensitive film according to a predetermined pattern to effect a tracing of the desired circuit configuration by said light spot on said photosensitive film;

including the following successive and cyclically repetitive steps subsequent to step (d) to provide a printed circuit formed of a desired number of insulated, serially connected conductor assemblies:

C. coating the terminal portions of each conductor with a lacquer;

D. coating the total surface of said conductors with a coherent insulating layer;

E. removing the lacquer coating from said conductors to expose the terminal portions thereof;

F. coating said exposed terminal portions and said insulating layer with a metal layer;

G. coating said last-named metal layer with a photosensitive film;

H. tracing a desired conductor configuration on said last-named photosensitive film by moving an impinging actinic light spot on said last-named photosensitive film; and

I. etching away those portions of the last-named metal layer that are subsequent to step (H) removable by a corrosive agent.

3,905,819

PHOTOPOLYMER PRINTING PLATE IMPROVED IN WATER RESISTANCE AND ITS PREPARATION

Kiyomi Sakurai, Hirakata; Yutaka Fukushima, Suita, and Yasuyuki Takimoto, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Dec. 6, 1973, Ser. No. 422,203

Claims priority, application Japan, Dec. 15, 1972, 47-126569

Int. Cl.² G03C *1/68, 5/00*

U.S. Cl. 96—35.1 **7 Claims**

1. A method for imparting water-resistance to a water developed photopolymer printing plate obtained by exposing a photopolymer printing plate, which is in close contact with a negative, to light and developing the resulting plate with water, said photopolymer printing plate consisting essentially of a support material and a layer thereupon of a water-soluble photosensitive resin composition comprising a water-soluble polymer containing hydroxyl groups, an acrylic monomer and a photopolymerization initiator, said method comprising the step of treating the surface of the water developed photopolymer printing plate with an aldehyde selected from the group consisting of glyoxylic acid and glyoxal in such amounts so as to acetalize the hydroxyl groups in the molecules of the water-soluble polymer in the water-soluble photosensitive composition.

3,905,820

LIGHT SENSITIVE COPOLYMERS, A PROCESS FOR THEIR MANUFACTURE AND COPYING COMPOSITIONS CONTAINING THEM

Werner Frass, Wiesbaden-Biebrich, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 327,100, Jan. 26, 1973, Pat. No. 3,857,822. This application May 7, 1974, Ser. No. 467,740

Claims priority, application Germany, Jan. 27, 1972, 2203732

Int. Cl.² G03C *1/70*

U.S. Cl. 96—86 P **8 Claims**

1. A light-sensitive copying composition which contains from 65 to 99 percent by weight of at least one copolymer containing from 10 to 55 mole percent of N-allyl-maleimide units, from 0 to 15 mole percent of maleic acid units and from 45 to 80 mole percent of units of the formula

$$-CH_2-CXZ-$$

wherein X is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl or alkoxy group containing from 1 to 3 carbon atoms, an aryl group or an acyloxy group, and Z is selected from the group consisting of a hydrogen atom, a halogen atom or an alkyl group containing 1 or 2 carbon atoms, from 0 to 35 percent by weight of at least one photopolymerizable compound having at least two vinyl or vinylidene groups in the molecule and which boils above 100°C under standard pressure, and from 1 to 8 percent by weight of at least one photoinitiator.

3,905,821

SENSITIZED SILVER HALIDE EMULSION CONTAINING A HALOGENATED TRIAZINE AS SENSITIZER AND A HALOGENATED COMPOUND HARDENING AGENT

Katsuhiko Ohtani; Yosuke Nakajima; Reiichi Ohi, all of Minami-Ashigara, Japan, and Tokiharu Kondo, deceased, late of Odawara, Japan (by Yoshiharu Kondo, legal representative), assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation-in-part of Ser. No. 74,520, Nov. 2, 1970, abandoned. This application July 13, 1973, Ser. No. 378,845

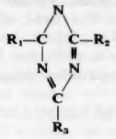
Claims priority, application Japan, Sept. 22, 1972, 47-75467

Int. Cl.² G03C *1/28*

U.S. Cl. 96—107 **8 Claims**

1. A gelatino silver halide photo-sensitive emulsion which comprises, a silver halide emulsion sensitized to its maximum sensitivity by conventional chemical sensitization containing a

sensitizing effective amount of a sensitizing compound represented by the following formula:



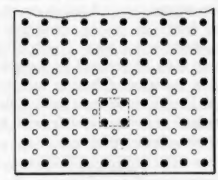
wherein R_1, R_2 and R_3 each represent a hydroxyl group, a hydroxylamino group, an amino group, an alkylamino group of from 1–6 carbon atoms, said alkyl group of said alkylamino group capable of being substituted by a member selected from the group consisting of a hydroxy group, a dialkylamino group of from 2 to 8 carbon atoms and an alkoxy group of from 1 to 4 carbon atoms, an arylamino group, said arylamino group capable of being substituted with a member selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an alkoxy group of from 1 to 4 carbon atoms, a hydroxy group and a halogen atom, an alkoxyl group of from 1 to 6 carbon atoms, an aryloxy group, said aryloxy group capable of being substituted wih a member selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an alkoxy group of from 1 to 4 carbon atoms, a hydroxy group, and a halogen atom, an alkyl group of from 1 to 6 carbon atoms, an aryl group, said aryl group capable of being substituted with a member selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an alkoxy group of from 1 to 4 carbon atoms, a hydroxy group, and a halogen atom, or a halogen atom, said compound represented by the above described formula containing no more than one group which is active to gelatin, with the proviso that if R_1, R_2 or R_3 is a halogen atom, no more than one of said R_1, R_2 and R_3 can be a halogen atom, and an organic hardening agent having an active halogen.

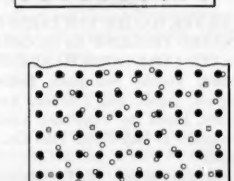
3,905,822

COMPOUND SCREEN FOR OBJECT SCREENING

Lawrence M. Marks, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1973, Ser. No. 408,707
Int. Cl.[2] G03F 5/00; G03G 16/00
U.S. Cl. 96—116 **10 Claims**





1. A compound document screen for extending the range of electrophotographic imaging processes and adapted for use proximate to the image face of an original document to be copied, said compound screen comprising:

a clear transparent substrate material having clear areas and bearing opaque areas;

said opaque areas comprising a repetitive pattern of substantially opaque mixed dots comprising substantially light absorbing like dots and substantially light reflecting like dots;

said like dots arranged with respect to other like dots at an average like dot inch frequency within the range of from about 50 to 400 dots.

3,905,823

MOLD RELEASE COMPOSITION

Charles Piskoti, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 298,159, Oct. 16, 1972. This application Mar. 29, 1974, Ser. No. 456,561
Int. Cl. B28b 7/36
U.S. Cl. 106—38.22 **12 Claims**

1. A release composition comprising:

A. from 1 to 25 percent by weight based on the weight of the composition of any organopolysiloxane fluid having an average viscosity of from 1,000 to 600,000 cs. at 25°C. in which the organic groups are selected from the class consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atoms and halogenated monovalent hydrocarbon radicals,

B. from 0.1 to 10 percent by weight based on the weight of the composition of an aminofunctional silicon fluid,

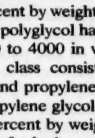
C. from 20 to 70 percent by weight based on the weight of the composition of mica having a particle size of from 60 to 600 mesh,

D. from 0.1 to 5.0 percent by weight based on the weight of the composition of a thickening agent for nonpolar solvents,

E. from 2 to 25 percent by weight based on the weight of the composition of a polyglycol having a molecular weight of from about 1500 to 4000 in which the polyglycol is selected from the class consisting of homopolymers of ethylene glycol and propylene glycol and copolymers of ethylene and propylene glycol,

F. from 20 to 60 percent by weight based on the weight of the composition of a hydrocarbon solvent having a boiling point below 200°C. at 760 mm Hg.,

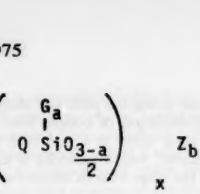
in which the aminofunctional silicon fluid is obtained from the equilibration of an organopolysiloxane selected from the class consisting of cyclic siloxanes of the formula



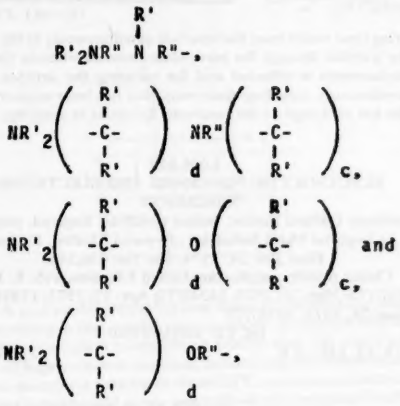
and siloxanes of the formula

$$R_ySiR_2O_{4-y-2}$$

and an aminofunctional silane or siloxane in the presence of a base catalyst, said aminofunctional silane or siloxane is represented by the formula



in which G is selected from the group consisting of R, OR', $OSiR_3$ and OR'' NR'_2 in which R is selected from the group consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atoms and halogenated monovalent hydrocarbon radicals, R' is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, R'' is selected from the group consisting of divalent hydrocarbon radicals, having up to 8 carbon atoms, divalent hydrocarbonoxy radicals selected from the class consisting of $(-OC_2H_4-)_r$, $(OC_2H_4OCH_2-)_r$ and $(OC_3H_6-)_r$ and unsaturated divalent hydrocarbon radicals having from 3 to 10 carbon atoms, Q is selected from the group consisting of $R'_2NR''-$,



Z is selected from the class consisting of $R'O_{0.5}$, $R_3SiO_{0.5}$ and $R'NR''$ $O_{0.5}$, R, R' and R'' are the same as above, *a* is a number of from 0 to 2, *b* is a number of from 0 to 3, *c* and *d* are each numbers of from 1 to 10, *r* is a number of from 1 to 50, *w* is a number of from 3 to 10, *x* is a number of from 1 to 20,000, *y* is a number of from about 0.5 to 2.49, *z* is a number of from 0.001 to 1 and the sum of *y* and *z* is a number of from 1 to 2.5.

3,905,824

GLASS-CERAMIC ARTICLES WITH ORIENTED MICA CRYSTALS AND METHOD

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,495

Int. Cl.² C03C *3/22*

U.S. Cl. 106—39.6 **4 Claims**

1. A glass-ceramic article comprising in at least a portion thereof an oriented principal crystal phase consisting of crystals selected from the group consisting of fluorphlogopite solid solution, alkaline earth metal fluormica, tetrasilicic fluormica and fluoramphibole crystals dispersed in a glassy matrix, said glass-ceramic article having a composition

a. consisting essentially, in weight percent, of about 26–60% SiO_2, 15–35% R_2O_3, wherein R_2O_3 consists of 5–15% B_2O_3 and 5–25% Al_2O_3, 2–20% R_2O, wherein R_2O consists of 0–15% K_2O, 0–15% Rb_2O and 0–20% Cs_2O, 4–25% MgO, 0–7% Li_2O, 6–25% MgO + Li_2O, and 4–20% F when the oriented principal crystal phase consists of fluorphlogopite solid solution crystals;

b. consisting essentially, in weight percent, of about 30–65% SiO_2, 5–26% Al_2O_3, 10–35% MgO, 3–30% RO wherein RO consists of 3–30% SrO and 0–25% BaO, and 3–15% F when the oriented principal crystal phase consists of alkaline earth metal fluormica crystals;

c. consisting essentially, in weight percent, of about 45–70% SiO_2, 8–20% MgO, 5–25% R_2O, wherein R_2O consists of 0–20% K_2O, 0–23% Rb_2O and 0–25% Cs_2O, 0–20% RO, wherein RO is selected from the group consisting of SrO, BaO and CdO, 5–35% total of R_2O + RO, 0–10% of oxides selected from the group consisting of As_2O_5 and Sb_2O_5, and 8–15% MgF_2 when the oriented principal crystal phase consists of tetrasilicic fluormica crystals; and

d. consisting essentially, in weight percent, of about 48–75% SiO_2, 5–27% MgO, 4–13% MgF_2, 0–15% Al_2O_3, 0–10% B_2O_3, and 3–20% R_2O, wherein R_2O is selected in the indicated proportion from the group consisting of 4–16% Na_2O and 3–10% Li_2O, when the oriented principal crystal phase consists of fluoramphibole crystals;

said oriented crystal phase being characterized by preferential alignment of the largest dimensions of the selected crystals in directions parallel to a common axis or plane.

4. A method for producing a glass-ceramic article comprising in at least a portion thereof an oriented crystal phase consisting of crystals selected from the group consisting of fluorphlogopite solid solution, alkaline earth metal fluormica, tetrasilicic fluormica, and fluoramphibole crystals dispersed in a glassy matrix which comprises the steps of:

a. melting a batch for a glass having a composition selected from the group of

i. compositions consisting essentially, in weight percent, of about 26–60% SiO_2, 15–35% R_2O_3, wherein R_2O_3 consists of 5–15% B_2O_3 and 5–25% Al_2O_3, 2–20% R_2O, wherein R_2O consists of 0–15% K_2O, 0–15% Na_2O, 0–15% Rb_2O and 0–20% Cs_2O, 4–25% MgO, 0–7% Li_2O, 6–25% MgO + Li_2O, and 4–20% F which are thermally-crystallizable to yield fluorophlogopite solid solution as the principal crystal phase;

ii. compositions consisting essentially, in weight percent, of about 30–65% SiO_2, 5–26% Al_2O_3, 10–35% MgO, 3–30% RO, wherein RO consists of 3–30% SrO and 0–25% BaO, and 3–15% F which are thermally-crystallizable to yield alkaline earth metal fluormica crystals as the principal crystal phase;

iii. compositions consisting essentially, in weight percent, of about 45–70% SiO_2, 8–20% MgO, 5–25% R_2O, wherein R_2O consists of 0–20% K_2O, 0–23% Rb_2O, and 0–25% Cs_2O, 0–20% RO, wherein RO is selected from the group consisting of SrO, BaO, and CdO, 5–35% total of R_2O + RO, 0–10% total of oxides selected from the group consisting of As_2O_5 and Sb_2O_5, and 8–15% MgF_2 which are thermally-crystallizable to yield tetrasilicic fluormica crystals as the principal crystal phase; and

iv. compositions consisting essentially, in weight percent, of about 48–75% SiO_2, 5–27% MgO, 4–13% MgF_2, 0–15% Al_2O_3, 0–10% B_2O_3, and 3–20% R_2O, wherein R_2O is selected in the indicated proportions from the group consisting of 4–16% Na_2O and 3–10% Li_2O, which are thermally-crystallizable to yield fluoramphibole crystals as the principal crystal phase;

b. cooling the molten glass to a temperature at least below the transformation range thereof while simultaneously forming a glass article therefrom;

c. heating the glass article to a temperature in the crystallization range thereof for a time at least sufficient to initiate the growth of said crystals therein;

d. adjusting the temperature of the glass article to achieve a glass viscosity in the range of about $10^{7.5}$–10^{10} poises to render the article plastically deformable;

e. deforming the glass article to align the crystals present therein; and

f. further heating the glass article at a temperature in the crystallization range for a time sufficient to complete the development of a principal crystal phase therein comprising at least about 50% by volume of the article.

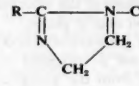
3,905,825

AZO-ACETYL-ACETARYL PIGMENT COMPOSITIONS READILY DISPERSED IN ORGANIC MEDIA

Ermanno Gaetani, Milan, and Vincenzo Massabo, Saronno, both of Italy, assignors to Aziende Colori Nazionali Affini ACNA S.p.A., Milan, Italy

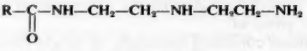
Continuation of Ser. No. 210,131, Dec. 20, 1971, abandoned. This application Jan. 31, 1974, Ser. No. 438,340
Claims priority, application Italy, Dec. 19, 1970, 33266/70
Int. Cl. C09b *67/00*
U.S. Cl. 106—308 N 7 Claims

1. An organic pigment composition that is obtained by treating an azo-acetyl-acetaryl pigment at a temperature of from about 70° to 200°C., for a period of from about 3 to 24 hours, with from about 3 to 40% by weight, based on the weight of the pigment, of an amine compound selected from the group consisting of (A) a heterocyclic amino compound of the formula:



(I)

and (B) an aliphatic diamine that is a precursor of the amino compound of formula (I), said diamine being of the formula:



(II)

wherein R represents, in each of formulas (I) and (II), an aliphatic chain selected from the group consisting of octadecyl, hexadecyl, tetradecyl, hydroxyoctadecyl, Δ9,10-octadecylene and Δ9,10-dodecylene; or a radical from a natural or modified resin acid selected from the group consisting of abietic acid, dehydroabietic acid and tetrahydroabietic acid

---

3,905,826

SETTING RETARDER COMPOSITION FOR USE IN CEMENTATION AND RECEMENTATION OF CASED OIL WELLS

Raul Poblano Ordonez, Xochimilco; Antonio Acuna Rosado, Tlalnepantla; Francisco Garaicochea Petrirena, Santa Maria la Rivera, and Edith Rivera de Campos, Atzcapotzalco la Villa, Mexico, assignors to Instituto Mexicano del Petroleo, Mexico City, Mexico

Continuation-in-part of Ser. No. 292,588, Sept. 27, 1972, abandoned. This application Jan. 8, 1974, Ser. No. 431,806
Claims priority, application Mexico, Jan. 10, 1972, 133376
Int. Cl.[2] C04B *13/22, 13/24*
U.S. Cl. 106—315 3 Claims

1. A composition for retarding the setting of cement which comprises a mixture of at least one of the group consisting of carboxymethyl cellulose and alkali salts of carboxymethyl cellulose, borax and dextrin, in the porportions by weight of 35 to 40%, 30 to 35% and 25 to 30%, respectively.

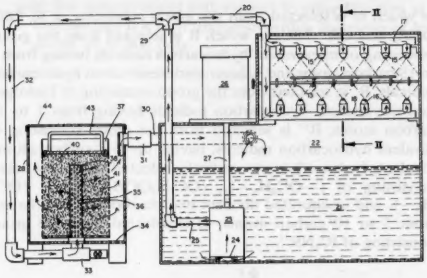
3,905,827

ETCHANT RINSE METHOD

Daniel L. Goffredo, Riverton, N.J., and John Alfred Dunkelberger, Jr., Centre Hall, Pa., assignors to Chemcut Corporation, State College, Pa.

Division of Ser. No. 190,136, Oct. 18, 1971. This application Oct. 29, 1974, Ser. No. 518,564
Int. Cl.[2] B08B *3/02, 3/10, 7/04*
U.S. Cl. 134—13 4 Claims

1. A method of removing residual chemical etchant from articles such as printed circuit boards and the like that have been subjected to etching of copper portions thereof, comprising the steps of conveying etched articles along a predetermined path, spraying the articles with a water rinse during their conveyance along the path and thereby accumulating a significant concentration of copper ions in the rinse water, collecting the rinse water in a reservoir, providing a tank of particulate material, which material is capable of replacing copper ions in the rinse with its own ions, continuously delivering rinse water from the reservoir simultaneously to the tank for transfer through the particulate material wherein the ion replacement is effected and for spraying the articles, and continuously recycling rinse water that has been subjected to the ion exchange to the reservoir, for reuse in spraying.

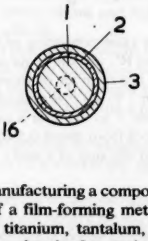


3,905,828

ELECTROLYTIC PROCESSES AND ELECTRODES THEREFOR

Anthony Clifford Barber, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, England

Filed Jan. 24, 1974, Ser. No. 436,348
Claims priority, application United Kingdom, Feb. 8, 1973, 6187/73; Mar. 26, 1973, 14349/73; Apr. 13, 1973, 17828/73; June 28, 1973, 30757/73
Int. Cl.[2] H01M *35/00*
U.S. Cl. 136—6 R 22 Claims



1. A method of manufacturing a composite body comprising an elongate body of a film-forming metal selected from the group consisting of titanium, tantalum, niobium, zirconium and their alloys with a sheath of a precious metal which comprises the steps of surrounding a body of a film-forming metal with a sheath of a precious metal, surrounding the body and sheath with a sleeve of solid deformable protection and lubrication material, sealing the body and sheath into the sleeve, and extruding the assembly so formed to produce the elongate body.

3,905,829

LEAD-ACID BATTERY PLATE WITH LOW DUSTING CHARACTERISTICS AND METHOD OF MANUFACTURE

Eugene Yehuda Weissman, Birmingham, Mich., and Basanta Kumar Mahato, Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 326,873, Jan. 26, 1973, abandoned. This application June 3, 1974, Ser. No. 475,944
Int. Cl.[2] H01M *39/00*
U.S. Cl. 136—26 14 Claims

1. A substantially dust-free uniformed leaded plate for lead-acid storage batteries comprising leady paste applied to a supporting grid structure and a water soluble coating cover-

ing the surface of said leady paste in a thin layer composed of a water soluble film forming polymeric compound.

10. A method of reducing leady dust from a plate for leada-cid storage batteries comprising pasting a supporting grid with a leady paste material to compose said plate, applying to said pasted plate a thin layer of a coating of a water soluble film forming polymeric compound, drying said coating material to result in a water soluble film of said polymeric compound, and removing substantially all of said water soluble film during formation of said plate.

3,905,830

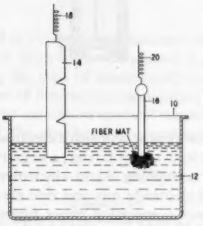
ZINC FIBERS AND NEEDLES AND PROCESS FOR PREPARING THE SAME

Demetrios V. Louzos, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 25,490, April 3, 1970, abandoned. This application Mar. 6, 1972, Ser. No. 231,831

Int. Cl. H01m *41/00*

U.S. Cl. 136—31 **10 Claims**



1. A process for preparing zinc fibers comprising the steps of providing a zinc anode and a cathode in contact with an electrolyte solution comprising a soluble zinc salt and a solvent of high dielectric constant, maintaining the temperature of the electrolyte solution at about 25°C., passing an electrical current between said anode and cathode of a magnitude sufficient to provide a cathode current density of at least about 500 amperes per square foot, thereby promoting the electroformation of the zinc fibers at the cathode and then removing the zinc fibers from the cathode.

2. A process for preparing zinc needles comprising the steps of providing a zinc anode and a cathode in contact with an electrolyte solution comprising a soluble zinc salt and a solvent of high dielectric constant, maintaining the temperature of the electrolyte solution above about 25°C., passing an electrical current between said anode and cathode of a magnitude sufficient to provide a cathode current density of at least about 500 amperes per square foot, thereby promoting the electroformation of zinc needles at the cathode and then removing the zinc needles from the cathode.

5. A process for preparing zinc filaments comprising the steps of providing a zinc anode and a cathode in contact with an electrolyte solution consisting essentially of a soluble zinc salt selected from the group consisting of the acetate, bromide, chloride, chlorate, formate, iodide, 1-phenol-4-sulphonate, sulphate, thiocyanate, borate, bromate, fluogallate, fluoborate, fluosilicate, glycerophosphate, nitrate, phosphate and sulphonate, and a solvent of high dielectric constant, maintaining the temperature of the electrolyte solution at least at about 25°C., passing an electrical current between said anode and cathode of a magnitude sufficient to provide a cathode current density of at least about 500 amperes per square foot, thereby promoting the electroformation of zinc filaments at the cathode and then removing the electroformed zinc filaments from the cathode.

10. A process for preparing zinc filaments comprising the steps of providing a zinc anode and a cathode in contact with an electrolyte solution consisting essentially of a soluble zinc salt selected from the group consisting of the acetate, bromide, chloride, chlorate, formate, iodide, 1-phenol-4-sulphonate, sulphate thiocyanate, borate, bromate, fluogallate, fluoborate, fluosilicate, glycerophosphate, nitrate, phosphate and sulphonate and a solvent of high dielectric constant selected from the group consisting of water, alcohols, nitromethane, propylene carbonate and dimethylformamide, maintaining the temperature of the electrolyte solution at least at about 25°C., passing an electrical current between said anode and cathode of a magnitude sufficient to provide a cathode current density of at least about 500 thereby ampered per square foot, thereby promoting the electroformation of zinc filaments at the cathode and then removing the electroformed zinc filaments from the cathode.

3,905,831

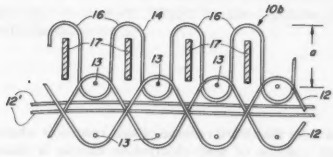
ELECTROCHEMICAL ELECTRODES

Perry H. Brown, Norwell, and Maurice H. Tremblay, Westboro, both of Mass., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 5,882, Jan. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 861,024, Sept. 25, 1969, abandoned. This application Oct. 12, 1971, Ser. No. 188,375

Int. Cl. H01m *13/00, 35/04*

U.S. Cl. 136—86 D **5 Claims**



1. A fuel cell comprising:

an electrolyte;

a pair of gas manifolds for fuel and oxidizer gases; and

a pair of electrodes interfaced between the electrolyte and the gas manifolds, at least one electrode incorporating

a base fabric comprised of staple fibers wherein a portion of the staple fibers are metallic fibers, and

pile yarns secured to the base fabric forming a pile surface projecting from one face of the fabric, the pile yarn being formed of filaments wherein part of the filaments are metal,

the metal filaments and fibers of the fabric and pile yarn having rough, unmachined and unburnished, fracture-free outer surfaces, thereby improving retention in the fabric.

3,905,832

NOVEL FUEL CELL STRUCTURE

John C. Trocciola, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

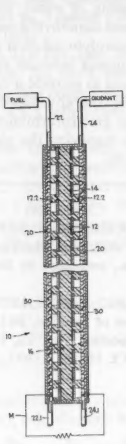
Filed Jan. 15, 1974, Ser. No. 433,446

Int. Cl. H01m *27/00*

U.S. Cl. 136—86 R **9 Claims**

1. A fuel cell having a pair of opposed electrodes, an electrolyte matrix positioned between said pair of electrodes, at least one of said pair of electrodes having a hydrophobic surface having a predetermined surface area, a reactant chamber adjacent said one of said pair of electrodes and in fluid contact with said hydrophobic surface, and an electrolyte reservoir positioned behind said one electrode to extend into and partially occupy the space of said chamber, said reservoir and electrolyte matrix containing an aqueous electrolyte and being in electrolyte communication with each other through said one electrode at select areas only substantially uniformly distributed throughout said hydrophobic predetermined surface area, said select areas being non-hydrophobic and consti-

tuting a minor area in relation to said hydrophobic predetermined surface area of said one electrode, said electrolyte



filling less than the entire volume of said reservoir whereby the electrolyte volume of said electrolyte matrix is maintained constant.

3,905,833

CYANIDE AND MERCURY CORROSION INHIBITORS FOR ZINC ALKALINE GALVANIC CELLS

Demetrios V. Louzos, Rocky River, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 8, 1973, Ser. No. 386,748
Int. Cl.[2] B08B *3/00*
U.S. Cl. 136—107 **6 Claims**

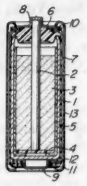
1. A galvanic cell comprising a zinc anode, a reducible cathode, an aqueous alkaline electrolyte, mercury, and at least one cyanide compound in an inhibiting amount selected from the group consisting of potassium cyanide, sodium cyanide, zinc cyanide, lithium cyanide, magnesium cyanide, calcium cyanide, barium cyanide, strontium cyanide, and aluminum cyanide.

3,905,834

DRY CELL

Masahiro Harada, Fujisawa; Matsuyuki Takeda, Isehara; Mamoru Ichida, Fujisawa; Shohei Nozaki, Fujisawa, and Kenji Miyahara, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 847,336, Aug. 4, 1969, abandoned. This application Apr. 18, 1972, Ser. No. 245,058
Claims priority, application Japan, Aug. 8, 1968, 43-56911; Sept. 16, 1968, 43-67432; Sept. 26, 1968, 43-70511; Oct. 31, 1968, 43-80221
Int. Cl. H01m *21/00, 3/00*
U.S. Cl. 136—107 **7 Claims**



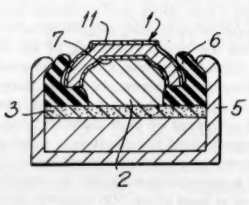
1. A dry cell comprising a positive electrode mix containing manganese dioxide as a depolarizer, a negative zinc electrode, and a separator containing liquid electrolyte and interposed between the said electrode mix and zinc electrode, said separator being a sheet comprising paper fibers and particles of electrolytic-gelling agent substantially uniformly distributed throughout the sheet and prepared by dispersing electrolytic-gelling agent particles and paper forming fibers, mixing the resulting dispersion until a substantially uniform mixture of particles and fibers is obtained, forming a sheet therefrom, and drying the sheet at a temperature at which the electrolytic-gelling agent is not gelled, whereby the particles of electrolytic-gelling agent in said separator are gelled by the said electrolyte liquid.

3,905,835

ALKALI BUTTON BATTERY

Yoshihiko Kasai, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 6, 1974, Ser. No. 477,065
Claims priority, application Japan, June 7, 1973, 48-64080
Int. Cl. H01m *21/00*
U.S. Cl. 136—111 **6 Claims**



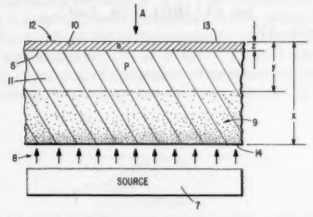
1. An alkali button battery comprising an alkaline electrolyte, an anode, a cathode, an anode cap in electrical contact with said anode, a casing in electrical contact with siad cathode, and a layer of gold or gold alloy on at least one of said cap and casing only on the exterior surface thereof.

3,905,836

PHOTOELECTRIC SEMICONDUCTOR DEVICES

Richard Epple, Schwaigern, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm, Germany

Continuation-in-part of Ser. No. 811,707, April 1, 1969, abandoned. This application Mar. 20, 1973, Ser. No. 343,175
Claims priority, application Germany, Apr. 3, 1968, 1764107
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 9 Claims



1. In a method of making a p-n junction photoelectric semiconductor device from a semiconductor body, the improvement comprising the step of intentionally producing a predetermined number of recombination centers in the interior of the body to set the maximum spectral sensitivity of the device as a function of the number of recombination centers produced.

3,905,837

METHOD OF TREATING TITANIUM-CONTAINING STRUCTURES

Donald W. Du Bois, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 239,991, March 31, 1972, Pat. No. 3,836,410. This application Jan. 4, 1974, Ser. No. 430,990
Int. Cl. C23g 1/02
U.S. Cl. 148—6.14 R 9 Claims

1. A method of removing metallic iron inclusions introduced during fabrication from fabricated, scale-free titanium structures intended for use in crevice corrosion susceptible environments which method comprises contacting the titanium structure with an aqueous acid composition comprising a first acid capable of oxidizing titanium which acid is chosen from the group consisting of nitric acid, chromic acid, and perchloric acid, and a second acid chosen from the group consisting of HF, HCl, HBr, HI, H_2SO_4, CCl_3COOH, and CF_3COOH, capable of forming soluble iron salts; and maintaining the acid composition in contact with titanium until the surface concentration of iron in the titanium is reduced below five parts per million.

3,905,838

BATH FOR TREATING ALUMINUM AND ALUMINUM ALLOYS TO FORM OXIDE FILM NONELECTROLYTICALLY THEREON AND METHOD FOR THE TREATMENT

Hikaru Ito, 95-20 Katsuragi-machi, Kishiwada, Osaka, Japan

Filed Apr. 10, 1974, Ser. No. 459,640
Int. Cl.[2] C23F 7/06
U.S. Cl. 148—6.27 11 Claims

1. A bath for nonelectrolytically forming a colored aluminum oxide film on the surface of metal body consisting at least predominantly of aluminum, which bath is an aqueous solution consisting essentially of 1.0 – 3.0 N aqueous ammonia, 0.3 – 6.0 g/500 cc of $KBrO_3$ as an oxidizing agent, 6 – 12 g/500 cc of KF, 2.5 – 8.0 g/500 cc of NH_4Cl and 0.05 – 0.50 g/500 cc of sorbitol, whereby said KF, NH_4Cl and sorbitol are inhibitors for retarding the elevation in bath temperature and for preventing the dissolution of the hydroxide first formed on the surface of said metal body when contacted with said bath and 1.5 – 5.0 cc/500 cc of triethanol amine.

3,905,839

PROCESS FOR PREPARING Nb_3SN TYPE SUPER-CONDUCTOR COMPOSITE WIRE

Yasuo Hashimoto of Fujisawa-shi, Kanagawa-ken, Japan

Filed February 26, 1974, Ser. No. 445,946
Int Cl. H01L 39/00
U.S. Cl. 148—11.5R 11 Claims

A process for preparing a Nb_3Sn super-conductor composite wire which comprises uniting into a single structure, a combination of a Nb wire and a Sn containing wire which is surrounded with Cu to form an intermetallic composite, wherein the atomic ratio of the Sn containing wire to the Nb wire is in the range of 1/8–3 when the Sn containing wire is a Sn-Cu alloy wire and 1/9–2 when the Sn containing wire is a Sn wire, wherein said Nb wire is separated from said Sn containing wire by a Cu layer such that said Nb wire and said Sn containing wire are not in mutual contact, drawing said intermetallic composite wire at a temperature of from 650°C to 1000°C, thereby uniformly diffusing the Sn through the Cu to form Nb_3Sn by the reaction of the Nb wire with the diffusing Sn.

3,905,840

CORROSION RESISTANT ALUMINUM ALLOYS

William H. Anthony and James M. Popplewell, both of Guilford, Conn.

Division of Ser. No. 451,074, March 14, 1974. This application Sept. 18, 1974, Ser. No. 507,017
Int. Cl. C22C 21/02
U.S. Cl. 148—32 7 Claims

1. A corrosion resistant aluminum alloy tube for the transport of aqueous solutions resistant to pitting and corrosion in an aqueous environment having a diameter of from 0.125 to 16'' and a wall thickness of from 0.02 to 0.375'', said tube being formed from an aluminum base alloy consisting essentially of from 0.05 to 0.5% silicon, wherein the silicon is present in solid solution, from 0.2 to 0.8% manganese, from 0.001 to 0.2% iron, from 0.001 to 0.1% chromium, from 0.001 to 0.1% magnesium, from 0.001 to 0.1% copper, from 0.001 to 0.05% titanium, from 0.001 to 0.1% zinc, balance aluminum.

3,905,841

METHOD OF IMPROVING DISPERSABILITY OF SMALL METALLIC MAGNETIC PARTICLES IN ORGANIC RESIN BINDERS

Alexander Simonetti, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1973, Ser. No. 393,258
Int. Cl.[2] H01F 1/02
U.S. Cl. 148—105 11 Claims

1. The method of producing finely divided metallic magnetic cobalt-phosphorous particles having substantially homogeneous dispersability in organic resin binders, said cobalt-phosphorous having been prepared by reacting a solution including hypophosphite anion reducing agent, and cobalt cations which are reduceable to cobalt metal by said hypophosphite, wherein the improvement comprises;

reacting said cobalt-phosphorous particles with sulfuric acid to reduce the relative percentage of cobalt and increase the relative percentage of phosphorous and to improve the dispersion characteristics of said cobalt-phosphorous in organic resin.

3,905,842

METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL WITH BORON ADDITION AND PRODUCT

Herbert E. Grenoble, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 431,128, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 326,852, Jan. 27, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,330

Int. Cl. H01f *1/04*

U.S. Cl. 148—111 10 Claims

1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a silicon-iron melt containing 2.2 to 4.5 percent silicon and lesser amounts of sulfur and manganese, incidental amounts of other elements including carbon, aluminum and oxygen, and balance iron, adding a source of boron to the melt, casting the melt and hot-rolling the resulting billet to form an elongated sheet-like body, cold-rolling the hot-rolled sheet-like body to provide a sheet of final gauge thickness containing from 5 to 45 parts per million boron and from about 15 to 95 ppm nitrogen and the proportions of nitrogen and boron being in the ratio range of two to four parts of nitrogen to one part of boron, from 0.007 to 0.06 percent sulfur and from 0.002 to 0.1 percent manganese and the proportions of the sulfur and manganese being such as to result in a minimum of about 0.007 percent sulfur in solute form during final annealing treatment, and subjecting the said cold-rolled sheet to a final heat treatment to decarburize it and to develop (110) [001] secondary recrystallization texture in it.

3,905,843

METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL WITH BORON ADDITION AND PRODUCT

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 429,791, Jan. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,669, Jan. 2, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,546

Int. Cl. H01f *1/04*

U.S. Cl. 148—111 13 Claims

1. The method of producing grain-oriented silicon-iron sheet which comprises the steps of providing a silicon-iron melt containing 2.2 to 4.5 per cent silicon, manganese and sulfur in amounts in a ratio of manganese to sulfur less than 2.1, between about three and about 35 parts per million boron, and between 30 and 60 parts per million nitrogen in the ratio to boron of one to fifteen parts per part of boron, casting the melt to form an ingot, hot rolling the ingot, then cold rolling to intermediate thickness, then heat treating the resulting cold-worked sheet, then cold rolling and reducing the sheet to final thickness, and finally subjecting the cold-rolled sheet to heat treatment to decarburize it and to develop (110)[001] secondary recrystallization texture in it.

3,905,844

METHOD OF MAKING A PN JUNCTION DEVICE BY METAL DOT ALLOYING AND RECRYSTALLIZATION

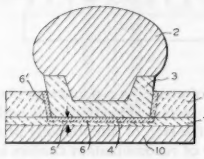
Tadashi Shiraishi, Yamatokoriyama, and Tadashi Yamanaka, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 261,332, June 9, 1972, abandoned. This application June 25, 1973, Ser. No. 373,294

Claims priority, application Japan, June 15, 1971, 46-43067; Aug. 9, 1971, 46-46068; Aug. 9, 1971, 46-60525; Aug. 9, 1971, 46-60531

Int. Cl.[2] H01L *7/36, 7/46*

U.S. Cl. 148—177 8 Claims



1. A method of making a PN junction device comprising, in the following recited order, the steps of:

preparing a semiconductor wafer of one conductivity type having one outer surface and an opposite outer surface;

alloying, by heating, a metal dot into said semiconductor wafer from said one outer surface, the portion of said semiconductor wafer having said metal dot alloyed thereinto being a recrystallization portion of the opposite conductivity type, said heating being maintained so as to make said recrystallization portion penetrate from said one outer surface to said opposite outer surface completely through said wafer; and

attaching a further semiconductor material of the same conductivity type as that of said semiconductor wafer to said opposite outer surface of said semiconductor wafer so as to form a PN junction, said further semiconductor material also being in contact with said recrystallization portion.

3,905,845

TRANSLUCENT ALUMINA CONTAINING MAGNESIA YTTRIA AND LANTHIUM OXIDE

Kazuo Kobayashi, Nagoya, and Masayuki Kaneno, Tokoname, both of Japan, assignors to NGK Insulators, Japan

Division of Ser. No. 64,694, Aug. 18, 1970, Pat. No. 3,791,142. This application Oct. 25, 1973, Ser. No. 409,362

Claims priority, application Japan, Aug. 27, 1969, 44-67338

Int. Cl. C04b *35/10*

U.S. Cl. 106—62 1 Claim

1. A translucent alumina having excellent optical transmission property for the light in the visible spectrum, thermal shock resistance and mechanical strength which consists essentially of 0.05–0.5% by weight of Y_2O_3, 0.05–0.5% by weight of La_2O_3, 0.01–0.1% by weight of MgO and the remainder of alumina and having an average crystal size of 10–20 microns.

3,905,846

COMPOSITE MODIFIED DOUBLE BASE PROPELLANT WITH METAL OXIDE STABILIZER

Dominic A. Berta, Wilmington, Del., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1973, Ser. No. 362,980
Int. Cl.² C06D 5/06
U.S. Cl. 149—19.4 26 Claims

1. A resorcinol-free composite-modified double base propellant consisting essentially of (1) an oxidizer, (2) a metal fuel, (3) a polyfunctional isocyanate, (4) a plasticizer, (5) a binder selected from the group consisting of nitrocellulose and plastisol nitrocellulose, (6) an oxide of a metal selected from the group consisting of cadmium, magnesium, aluminum, tin, lead, titanium, zirconium and mixtures thereof as the stabilizer.

3,905,847

UREA-ALDEHYDE RESIN ADHESIVES AND PROCESS

William Raymond Black, Springfield, Oreg., assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 797,253, Feb. 6, 1969, Pat. No. 3,697,355.
This application Apr. 23, 1971, Ser. No. 137,036
Int. Cl.² B29J 5/00
U.S. Cl. 156—62.2 6 Claims

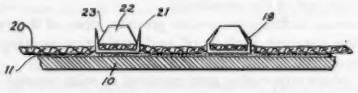
1. The process of making particle board which comprises
a. treating wood flakes with an aqueous adhesive solution so as to deposit approximately 3–15 parts of solids per 100 parts by weight of wood, said solids consisting essentially of a urea-formaldehyde resin and a material selected from the group consisting of sodium chloride and a mixture of sodium and magnesium chlorides, the material being present in an amount from about 1 to about 35% by weight of the total urea-formaldehyde and material solids.
b. consolidating the resulting mass under pressure to desired shape, and
c. exposing the mass to a temperature of from about 280° to 425°F. for about 2–20 minutes to cure the resin.

3,905,848

METHOD OF APPLYING STONES TO SHEET MATERIAL

Louis Vai Williams, 236 E. 74th St., New York, N.Y. 10021

Filed Sept. 3, 1974, Ser. No. 502,782
Int. Cl.² B44C 1/24
U.S. Cl. 156—63 11 Claims



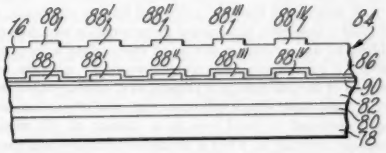
1. A method of applying stones to sheet material comprising
a. a sheet of translucent paper having substantially transparent adhesive on one side,
b. a pre-printed design on the reverse side thereof,
c. a removable protective sheet covering the adhesive side,
d. peeling said protective sheet from the adhesive exposing the design on the reverse side of said paper sheet,
e. placing a series of prong settings upon the adhesive side over the pre-printed design with the prongs in upward position,
f. placing a sheet of material upon the prongs of the settings,
g. pressing said material down with a sponge-like material so that the prongs pass through said material,
h. placing stones having inwardly inclined side facets within the upstanding prongs of said settings,
i. bending the prongs of said settings inwardly against the side facets of said stones to fix each stone within its setting,
j. then removing said sheet of translucent paper from said material.

3,905,849

TEXTURED SHEET MATERIAL AND METHOD OF PREPARATION THEREOF

Rene F. Bomboire, Wiltz, Luxemburg, assignor to Eurofloor S.A., Luxemburg

Filed Aug. 21, 1973, Ser. No. 390,237
Claims priority, application Luxemburg, Aug. 31, 1972, 65989
Int. Cl.² B32B 31/06, 31/12, 31/26, 3/18
U.S. Cl. 156—79 11 Claims



1. A method for the manufacture of sheet material having a textured wear surface comprising the steps of:
printing a decoration on the verso of a sheet of transparent thermoplastic resinous material;
drying the printed decoration;
printing at least one discontinuous intermediary layer of vinyl resin plastisol over selected regions of the printed decoration, the plastisol being applied so as to be in registration with at least portions of the decoration and being applied in regions which are to form the raised relief portions of the textured end product surface;
dimensionally stabilizing the plastisol by subjecting the printed sheet to a temperature in excess of 120°C; and
laminating the transparent sheet to a support without destroying the relief pattern defined by the plastisol, lamination being affected by the application of heat and pressure, the verso of the transparent sheet facing the support during lamination and the transparent thermoplastic sheet material flowing into the cavities defined by the discontinuous intermediary layer of plastisol during lamination whereby the discontinuous intermediary layer applied on the verso of the transparent sheet will cause formation of a relief on the recto of the finished product.

3,905,850

METHOD OF MANUFACTURE OF AN AIR-TO-AIR HEAT EXCHANGER

William J. Darm, 5818 SW. Tucker, Beaverton, Oreg. 97005

Continuation-in-part of Ser. No. 31,092, April 23, 1970, abandoned, Continuation of Ser. No. 221,543, Jan. 28, 1972, abandoned. This application May 10, 1974, Ser. No. 468,659

Int. Cl.[2] **B32B** *7/08;* **B23P** *15/26;* **B29C** *27/00;* **B29D** *3/00*

U.S. Cl. 156—91 **7 Claims**

5. In the manufacture of a heat exchanger the method comprising:

assembling multiple exchanger plates;

securing the edges in each of two opposite sets of adjacent edges of the plates with spacer clips which set the spacing of the edges and tie the plates together as a unit in the assembly;

joining the opposite ends of the exchanger plates to the ends of other exchanger plates adjacent thereto, at least some of said plates having ends divided into two end portions which are joined to different exchanger plates on opposite sides thereof to form two separate sets of channels; and

sealing the two opposite sets of edges of the assembly of exchanger plates with layers of resin and permitting the resin to harden about said opposite sets of edges.

3,905,851

METHOD OF MAKING BATTERY SEPARATORS

Charles Davis, Jr., Warrensville Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 252,510, May 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 159,543, June 2, 1971, abandoned. This application Mar. 22, 1974, Ser. No. 454,144

Int. Cl. H01m *3/02*

U.S. Cl. 136—131 **8 Claims**

1. A method of forming a dry cell having an anode, a cathode and a separator interposed therebetween which comprises adding to an aqueous solution of electrolyte salts polyacrylamide, a chromium-containing compound wherein a major portion of the chromium is present at a valence other than +3, and a compound which will react with said chromium-containing compound to yield ions at a valence of +3; mixing the resultant mixture to form a separator mixture and thereafter placing said separator mixture adjacent to said anode.

3,905,852

METHOD OF PRODUCING BRANCHED PHOTON-CONDUCTIVE FIBER BUNDLES

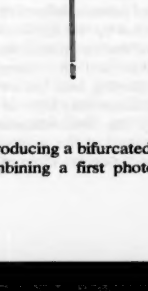
Kunihiko Mukai, and Kikuo Ikeda, both of Tsu, Japan, assignors to Nippon Glass Fiber Co., Ltd., Japan

Filed Dec. 4, 1973, Ser. No. 421,722

Claims priority, application Japan, Dec. 19, 1972, 47-127363

Int. Cl. D04h *3/08*

U.S. Cl. 156—180 **5 Claims**



1. A method for producing a bifurcated photon-conductive fiber bundle by combining a first photon-conductive fiber filament and second photon-conductive fiber filaments, the first fiber filament having a larger diameter than any of the second fiber filaments, the method comprising the following steps

a. passing said first fiber filament through a larger diametered hole formed in the center of a fiber bundling guide plate,

b. converging said second fiber filaments onto said first fiber filament by passing said second fiber filaments respectively through a plurality of smaller diametered holes in said guide plate, the smaller diametered holes being arranged around the larger diametered holes and being inclined toward the first fiber filament,

c. concentrically arranging said second fiber filaments to said first fiber filament, and,

d. bonding the filaments together.

3,905,853

REINFORCED PLASTICS TUBES

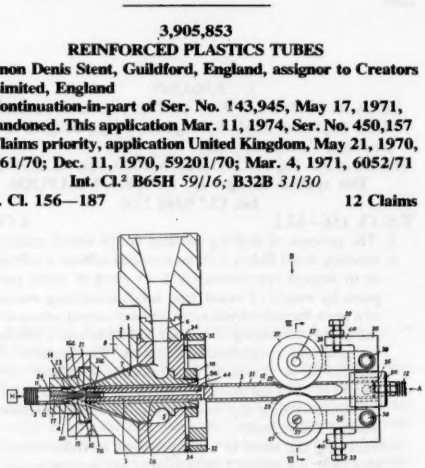
Vernon Denis Stent, Guildford, England, assignor to Creators Limited, England

Continuation-in-part of Ser. No. 143,945, May 17, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 450,157

Claims priority, application United Kingdom, May 21, 1970, 24761/70; Dec. 11, 1970, 59201/70; Mar. 4, 1971, 6052/71

Int. Cl.[2] **B65H** *59/16;* **B32B** *31/30*

U.S. Cl. 156—187 **12 Claims**



1. Apparatus for manufacturing a reinforced tube comprising an extruded wall selected from plastics and elastomeric materials and having a woven tubular mesh material embedded therein, comprising:

a. an extrusion crosshead having a front end and a rear end and wall means defining a straight passage extending through said crosshead from its rear end to its front end and having external die means at its front end,

b. an elongate mandrel which is straight throughout its length, said mandrel being positioned within and spaced from the wall means defining said passage and comprising at one end a die pin co-operating with said external die means to form a tubular extrusion nozzle through which plasticised material fed to said crosshead is extruded, and having its other end projecting beyond said passage at the rear end of the crosshead,

c. means defining transverse grooves, open at their ends, in the external surface of said projecting portion of the mandrel, and,

d. means supporting said mandrel in said passage and restraining said mandrel against axial movement comprising support rollers engaging in said transverse grooves and adapted to pinch the woven tubular mesh material between said rollers and said grooves and thereby hold the tubular mesh material in controlled tension while it is being continuously drawn along said mandrel through the passage and the nozzle.

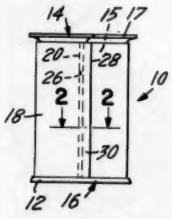
9. The method of making a reinforce tube comprising an extruded wall of plastics or elastomeric material having a woven tubular mesh embedded therein, which comprises the steps of:

a. providing a woven tubular mesh material comprising longitudinally extending warps interwoven with longitudinally spaced circumferentially extending wefts,
b. threading a free end of said woven tubular mesh through a straight passage extending from the rear end to the front end of an extrusion crosshead so that said free end projects beyond the front end of said passage.
c. inserting a straight mandrel of smaller diameter than but longer than said passage and having transverse open-ended groove means adjacent its rear end into said projecting free end of said tubular mesh, said rear end of said mandrel first,
d. positioning the mandrel, surrounded with the tubular mesh, in said passage with the front end of the mandrel defining with the front end of the passage a tubular extrusion nozzle and with its rear end provided with said transverse groove means projecting beyond the rear end of said passage,
e. forcing the tubular mesh into said transverse open-ended groove means by support rollers whereby to restrain the mandrel against axial movement and to pinch the mesh between the rollers and the groove means while permitting the mesh to be pulled past the rollers and along the mandrel,
f. extruding a plasticised material through said nozzle to extrude a tubular extrudate with the tubular mesh embedded therein, and
g. hauling off the extrudate against controlled tension in the tubular material produced by the pinching of the mesh between the support rollers and the groove means.

3,905,854
METHOD OF PROVIDING A LABELED SIDE-SEAMED CAN BODY

Ralph William Kaercher, Barrington, Ill., and Stanley Wiswell Pierce, deceased, late of Lombard, Ill. (By Martha Murphy Pierce, executrix), assignors to American Can Company, Greenwich, Conn.

Filed June 26, 1973, Ser. No. 373,769
Int. Cl.² B29C *17/02;* **B65B** *11/48;* **B65C** *3/06;* **C09J** *5/06*
U.S. Cl. 156—212 **31 Claims**

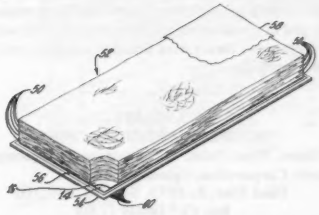


1. A method of providing a labeled cylindrical side-seamed metal can body whose body wall has a non-stretchable wrinkle-free water-resistant film label substantially 100% bonded thereto, which comprises:
providing an empty side-seamed cylindrical metal can body, the side seam area of the can body wall having a side seam juncture,
providing a non-stretchable, water-resistant film label comprising a base layer and a quick-tack hot-melt adhesive layer, the adhesive being selected from the group consisting of a wax material and an ethylenic acidic polymer, the label having leading and trailing edges and respectively adjacent marginal edge portions when it is applied to the can body,
heating the can body to a temperature within the tackifying temperature range of the adhesive,
adhering the film label to substantially the entire circumference of the heated can body by positioning and adhering the leading marginal edge within the side seam area parallel to the central axis of the can body and to the side seam juncture, adhering the body of the film label to substantially the entire circumference of the can body, and overlapping and adhering the trailing marginal edge portion to a portion of the underlying leading marginal edge portion of the label so that the overlap is within the side seam area.

3,905,855
RIGID FIBROUS PANEL AND METHOD OF MAKING SAME

Donald A. Blewett, Granville, and Richard G. Adams, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 1, 1972, Ser. No. 302,944
Int. Cl.² C09J *5/00*
U.S. Cl. 156—323 **10 Claims**



1. A method of making a rigid building panel comprising positioning a substantially non-porous and washable plastic film on a caul plate, placing a plurality of layers of glass fibers having binder therein on said film, placing the combination of the caul plate, film, and fibrous layers in a press between heated upper and lower platens, placing an insulating layer only between the lower platen and the caul plate, moving at least one of said platens relative to the other to squeeze and densify the fibrous layers to a fixed thickness while applying heat to the fibrous layers to cure the binder and to adhere the plastic film to the fibrous layers, maintaining the heat and pressure for a time sufficient to cure the binder to an extent to form the fibrous layers into a self-supporting, unified, densified mass, said plastic film being capable of withstanding the curing heat, and removing resulting composite panel from the press.

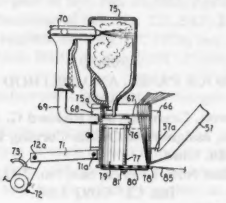
3,905,856
METHOD AND APPARATUS FOR FILAMENT WINDING ON A CORRUGATED FORM TO PRODUCE A CYLINDRICAL CORRUGATED GLASS FIBER PART

Donald L. Magee, Rt. 8, Lincoln, Nebr. 68506; Walter A. Bailey, 3440 N. 66th St., Lincoln, Nebr. 68507, and Roger P. Bailey, 4131 Clifford Dr., Lincoln, Nebr. 68506

Division of Ser. No. 282,255, Aug. 21, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,015
Int. Cl.² B65H *81/00*
U.S. Cl. 156—425 **6 Claims**

1. An apparatus for filament winding glass fiber on a continuous corrugated form, said apparatus comprising
an applicator, said applicator being capable of applying a band to said form, said band being comprised of at least one glass fiber strand,
means for causing relative motion between said form and said applicator,
means for reciprocatingly moving said applicator through a prescribed path relative to a preselected surface area of said form, said applicator thereby effecting a spiral wrap of said strand around said form, said applicator including a receptacle for holding liquid resin and catalyst,
means for continuously delivering liquified resin and catalyst to said receptacle during the operation of said appa-

ratus, said delivering means including a catalyst and resin spray gun having an aerosol spray emitting therefrom, and



means associated with said spray gun to liquify the aerosol spray emitting therefrom, said liquifying means having one end in communicating relationship with said receptacle to thereby direct said liquified catalyst and resin into said receptacle.

3,905,857

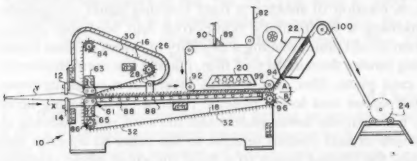
BONDED CARPET MACHINE

Joe T. Short, West Point, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 8, 1973, Ser. No. 339,210

Int. Cl.² D04H *11/08*

U.S. Cl. 156—435 **9 Claims**



1. A machine to produce a bonded pile loop carpet comprising: an endless upper pattern chain, an endless lower pattern chain, each of said chains having slats thereon, means mounting said upper chain in operative relationship with said lower chain, means to guide yarn between said chains, means to guide said chains into meshing relationship to push yarn down between adjacent slats of said lower chain to form a loop therebetween, means to alter the height of loops formed between said lower slats, means to apply a backing to said loops to form a carpet and means to take up the formed carpet, said slats of said lower endless chain being serrated on both sides to retain yarn loops therebetween until released from the machine.

3,905,858

APPARATUS FOR PREPARING STRIPED SHEET MATERIAL CONTINUOUSLY

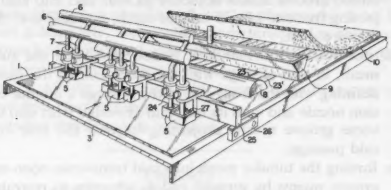
John K. Townsend, Torrance, and Chester E. Sanford, Lomita, both of Calif., assignors to Vistron Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 221,311, Jan. 27, 1972, which is a continuation-in-part of Ser. No. 37,172, May 14, 1970, Pat. No. 3,716,431, which is a continuation-in-part of Ser. No. 695,448, Jan. 3, 1968, abandoned. This application Jan. 23, 1974, Ser. No. 435,739

Int. Cl.² B32B *5/00, 31/00;* **B29J** *5/00*

U.S. Cl. 156—436 **1 Claim**

1. In an apparatus for continuously producing a plastic product of predetermined cross-section, comprising means for providing a moving flexible carrier web, means for depositing curable liquid resin on the carrier web, means for depositing fibrous-reinforcing material onto the liquid resin and lowering the reinforcing material into the liquid resin, means for placing a flexible cover web on the liquid resin and reinforcing material, forming means of predetermined cross-section, means to pull the flexible films with the resin therebetween through the forming means and first curing means disposed adjacent to the forming means to substantially completely cure the resin while it is being moved through said first curing means, the improvement comprising at least one striping



member removably and slidably disposed to ride on the moving carrier web and a second curing means ahead of said first means and said means for depositing liquid resin and fibrous-reinforcing material, and means for continuously supplying heat curable colored liquid striping material to said striping member to deposit at least one stripe of predetermined and substantially unvarying thickness and width on the carrier web said second curing means being used to partially cure said deposited striping material

---

3,905,859

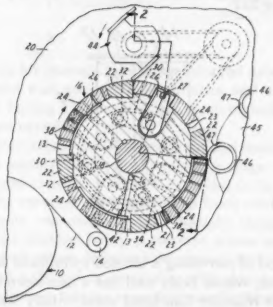
VACUUM WHEEL APPARATUS FOR APPLYING TABBED STRIPS OF ADHESIVE TAPE

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 29, 1974, Ser. No. 527,949

Int. Cl.² B65C *9/04;* **B32B** *31/00*

U.S. Cl. 156—443 **3 Claims**



1. An apparatus for forming and applying a tabbed strip of adhesive tape to an object comprising:

a frame;

a wheel mounted for rotation on a supporting shaft attached to said frame;

a plurality of fixed anvils evenly spaced about the periphery of said wheel;

a plurality of oscillating vacuum applicating segments, having a perforated applicating surface, supported for arcuate oscillatory motion in the space between said fixed anvils, each of said oscillating segments moving from an open to a closed position with respect to a complementary fixed anvil and each of said applicating segments having a leg with the end of said leg distal said segment and fixedly mounted to a pin rotatably mounted on said vacuum wheel:

positioning means are provided for rotating said pins to move said segments through the desired oscillatory movement upon rotation of said wheel;

vacuum means for supplying a vacuum to said applicating segments and the area between said applicating segments and said fixed anvils for holding the tape on the segments and for drawing the tape into the gap between an end of the segment and the complementary fixed anvil;

feed means for feeding tape from a supply of tape having a pressure-sensitive adhesive disposed on one side thereof to said applicating segments with the adhesive exposed; and

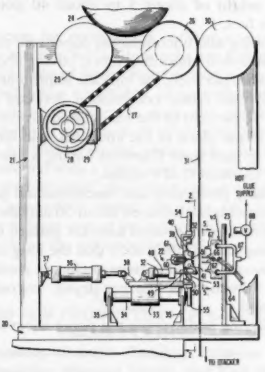
cutting means for severing said tape placed upon said wheel into lengths;

whereby as said vacuum wheel rotates tape is fed onto the surface of the wheel and is cut into lengths with said segments moving with relation to said anvils to form a tab on the tape when one of the applicating segments is moved to a closed configuration, said tab being formed as the tape spanning the space between one of said applicating segments and one of said fixed anvils in the open configuration is drawn by the vacuum into the space between said segments and is formed into a tab by the pressure between the segment and anvil as they move to the closed position.

3,905,860
APPARATUS FOR PRODUCING HEMS ON CLOTH ARTICLES BY MEANS OF ADHESIVE

Ronald W. Emus, Greer, S.C., assignor to Southern Machinery Company, Greer, S.C.

Division of Ser. No. 143,383, May 14, 1971, Pat. No. 3,755,033. This application Feb. 23, 1973, Ser. No. 335,168
Int. Cl. B32b *31/00;* **D03d** *47/50*
U.S. Cl. 156—459 **12 Claims**

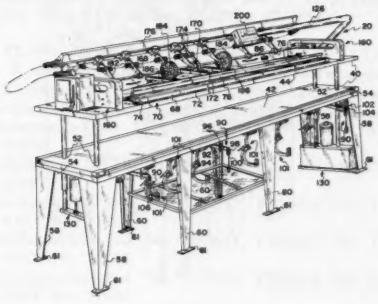


1. Apparatus for producing hems on sheet material articles comprising means to feed a web of sheet material vertically between two opposing instrumentalities at a hemming station, means to horizontally reciprocate one instrumentality toward the other at the hemming station to engage the web at two vertically spaced points and form two loops therein, means to sever the web between the two loops horizontally while the web is being engaged, means to turn the separated loops ninety degrees upwardly and downwardly so that they are substantially in the plane of the web, means to again engage the web on one side thereof and to form second loops therein adjacent the first-named loops and to substantially simultaneously inject adhesive into the second loops, the first and second loops now disposed substantially at right angles to the plane of the web, and means to press the first and second loops together vertically to complete hems on the trailing end of the severed article and on the leading end of the next oncoming article.

3,905,861
POSTFORMING

Alton L. Fritz, Phoenix, Ariz., assignor to Royal Industries, Inc., Pasadena, Calif.

Continuation of Ser. No. 144,105, May 17, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 388,299
Int. Cl.² B30B *12/00, 15/34;* **B32B** *31/10*
U.S. Cl. 156—499 **6 Claims**



1. A postforming apparatus comprising:

a reciprocable press comprising lower press means, upper press means and power means for reciprocating the press between open and closed positions, the closed position clamping a workpiece between the upper and lower press means said workpiece comprising a base and a postformable plastic veneer;

a heater assembly mounted above the upper press means comprising: (a) a longitudinally extending structure comprising elongated heat-producing means and reflecting shield means located to one side of and carrying the heat-producing means, (b) support shaft means comprising an axis of rotation for said shield means and heat-producing means, (c) power drive means for causing both rotational and translational motion of said shaft means, (d) a plurality of supports non-rotatably joined to the support shaft means and rotatably and pivotally joined to the shield each forming a radius between the shaft means and the shield means, (e) at least one shield-orientation means rotatably and pivotally joined to the shield means and rotatably joined to the shaft means, respectively, whereby upon actuation the power drive means rotates and translates the shaft means and the shaft means in turn rotates the supports, the shield means and the heat-producing means as a unit about the axis of the shaft means between an elevated disposition above the upper press means to a disposition adjacent a side of the upper press means, said power drive means also causing the shield orientation means to selectively rotate the shield means and the heat-producing means pivotally at said joints with said plurality of supports and shield orientation means as the side position is approached causing a reorientation of the shield from generally below to directly above the heat-producing means for heat softening the edge of the plastic postformable veneer of the workpiece thereby accomodating permanent contoured postforming lamination between the plastic veneer edge and the adjacent base.

3,905,862

CAULKING APPARATUS

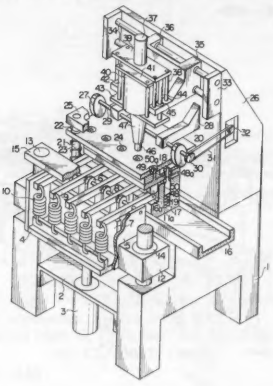
Naoki Takahashi; Yukinori Taneda, both of Yokohama, and Takashi Kobayashi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,959

Claims priority, application Japan, Oct. 17, 1973, 48-115765

Int. Cl.[2] B29C *27/08;* B23K *1/06*

U.S. Cl. 156—580 1 Claim



1. A caulking apparatus comprising:

a. a jig including a supporting surface and formed with a cutout, said jig being provided with a plurality of guide pins mounted in holes formed in the jig and each being urged by a resilient member to extend upwardly from said supporting surface, said supporting surface being adapted to receive thereon a member to be caulked and a member for caulking, said member to be caulked having a plurality of projections for caulking and said member for caulking being formed with a plurality of openings, said two members being arranged relative to each other such that the member for caulking is superposed on the member to be caulked with the projections for caulking being received in the respective openings, said projections for caulking being disposed above said cutout;

b. a pressure receiving plate arranged in juxtaposed relation with said supporting surface of said jig provided with the guide pins and spaced therefrom a predetermined distance, said pressure receiving plate being formed with a plurality of apertures each disposed in a position corresponding to a position in which one of said projections for caulking is disposed;

c. means for moving said pressure receiving plate in sliding motion toward said supporting surface of said jig;

d. a plurality of pressers each dispsoed in a position corresponding to a position in which one of said projections for caulking of said member to be caulked is disposed, said member to be caulked being positioned in face-to-face relation with said pressure receiving plate and disposed above said cutout formed in said jig;

e. means for applying pressure to cause all the pressers to move in the direction of said pressure receiving plate until the pressers each reach a position in which it is disposed above said supporting surface of said jig;

f. a plurality of resilient members each associated with one of said plurality of pressers and interposed between each of said pressers and said pressure applying means; and

g. a ultrasonic generator mechanism adapted to be brought into engagement with each of said projections for caulking of said member to be caulked extending through one of said plurality of apertures formed in said pressure receiving plate so as to transmit pressure waves of ultrasonic frequency to each said projection whereby said projections for caulking can be treated ultrasonically to caulk the edges of the member for caulking and the projections for caulking.

3,905,863

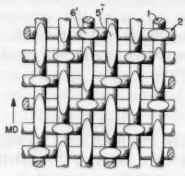
PROCESS FOR FORMING ABSORBENT PAPER BY IMPRINTING A SEMI-TWILL FABRIC KNUCKLE PATTERN THEREON PRIOR TO FINAL DRYING AND PAPER THEREOF

Peter G. Ayers, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 368,440, June 8, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 457,043

Int. Cl.[2] D21H *5/24*

U.S. Cl. 162—113 6 Claims



1. A process for the manufacture of a soft, bulky and absorbent paper sheet which comprises the steps of:

a. forming an uncompacted paper web having a uniform basis weight of about 5 to about 40 pounds per 3000 square feet,

b. supporting said uncompacted paper web on the back side of a semi-twill imprinting fabric having about 20 to about 60 meshes per inch, the knuckle imprint area on the back side of said fabric constituting between about 20 and about 50 percent of the total fabric surface area, as measured in the plane of the knuckles, said imprinting fabric being formed from filaments having a diameter of about 0.008 to about 0.025 inches,

c. thermally pre-drying said uncompacted paper web to a fiber consistency between about 30 and about 98 percent,

d. imprinting a dot-dash knuckle pattern with said semi-twill imprinting fabric such that the long axis of the dash impressions in said pattern is aligned parallel to the machine direction of the pre-dryed, uncompacted paper web, and

e. final drying and creping the paper sheet so formed.

3,905,864

MULTI-PLY FIBROUS SHEETS

Harold George Curry, Hambrook; Brian William Attwood, Hanham near Bristol, and Derek Graham Walter White, Bristol, all of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Filed Aug. 21, 1973, Ser. No. 390,244

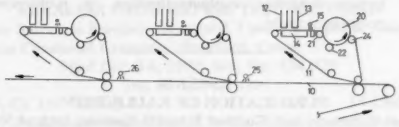
Claims priority, application United Kingdom, Sept. 9, 1972, 41960/72

Int. Cl. B29c *17/04;* D04h *1/16;* D21f *11/00*

U.S. Cl. 162—133 8 Claims

1. A method of making multi-ply paper board or sheet comprising forming the plies individually by passing gas streams containing suspended paper-forming fibres, through auxiliary permeable forming surfaces at separate ply-forming stations to form individual fibrous layers thereon, consolidating the layers individually at their respective ply-forming stations by moistening the layers and passing the fibrous layers

with binder through heated pressure nips to subject them individually to hot moist pressing and subsequently transferring said consolidated fibrous layers onto a main forming surface on which the multi-ply board or sheet is formed.



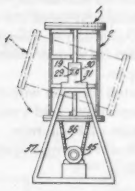
3,905,865
CELL AND VACCINE PRODUCTION

William J. McAleer, Ambler; Raymond E. Spier, and Kenneth L. Posch, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 275,642, July 27, 1972, Pat. No. 3,839,155. This application May 29, 1974, Ser. No. 474,279

Int. Cl.² C12B *1/00*

U.S. Cl. 195—1.1 **6 Claims**



1. In a process for propagating cells or a virus wherein a liquid culture medium and culture cells are added to a propagator vessel capable of both rotatable and tumbling motion, the vessel containing a plurality of impermeable separated plates rotatively mounted on a shaft, the plates capable of supporting growth of cells on both sides of the plates, wherein culture cells are plated on the plates, wherein the medium optionally is seeded with a virus, and wherein the propagator cells or virus are harvested, the improvement which comprises tumbling the propagator vessel end over end at controlled speeds during at least one of the cell plating cycle or the cell harvesting cycle or the virus seeding cycle.

3,905,866
PROCESS FOR PRODUCTION OF L-LYSINE BY FERMENTATION

Kiyoshi Watanabe; Tutomu Tanaka; Tamotsu Hirakawa; Hideaki Kinoshita; Mamoru Sasaki, and Koji Obayashi, all of Hyogo, Japan, assignors to Kanegafuchi Chemical Industries, Osaka, Japan

Filed Aug. 2, 1973, Ser. No. 384,844

Claims priority, application Japan, Aug. 2, 1972, 47-77978; Aug. 2, 1972, 47-77979

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R **5 Claims**

1. A process for the production of L-lysine by fermentation which comprises cultivating aerobically an L-lysine-producing mutant strain of a microorganism belonging to the Genus Pseudomonas or belonging to *Achromobacter coagulans* ATCC 21934 which are the parent strains, in a culture medium containing a hydrocarbon as a main carbon source until a substantial amount of L-lysine is accumulated in the culture medium and recovering the thus accumulated L-lysine from the culture broth, said mutant strain being resistant to at least one amino acid or analogue thereof selected from the group consisting of L-valine α-amino-butyric acid, norvaline, β-hydroxynorvaline, α-amino-β-chlorobutyric acid and L-threonine.

3,905,867
METHOD OF PRODUCING L-LYSINE BY FERMENTATION

Yasuo Kurimura; Yoshio Furutani, both of Yokohama; Nobuyoshi Makiguchi, Fujisawa, and Kenji Souda, Uji, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jan. 17, 1973, Ser. No. 324,319

Claims priority, application Japan, Jan. 21, 1972, 47-7632; Jan. 21, 1972, 47-7633; Jan. 21, 1972, 47-7634

Int. Cl.² C12D *13/06*

U.S. Cl. 195—28 R **6 Claims**

1. A method of producing L-lysine by microorganisms which comprises culturing under aerobic conditions, an L-lysine-producing mutant selected from the group consisting of Arthobacter B-1 No. 1772-193, FERM-P No. 1295, ATCC No. 21868,
Arthrobacter B-1 No. 55-8, FERM-P No. 1296, ATCC No. 21867,
Brevibacterium B-4 No. 1506-13, FERM-P No. 1297, ATCC No. 21866,
Brevibacterium B-4 No. 1899-31, FERM-P No. 1298, ATCC No. 28165,
Brevibacterium B-4 No. 1433-54, FERM-P No. 1299, ATCC No. 21864,
Corynebacterium 18S No. 728-26, FERM-P No. 1300, ATCC No. 21863,
Corynebacterium 18S No. 351-23, FERM-P No. 1301, ATCC No. 21862,
Arthrobacter B-1 No. 874-75, FERM-P No. 1302, ATCC No. 21861,
Brevibacterium B-4, No. 1304-31, FERM-P No. 1303, ATCC No. 28160,
Arthrobacter B-1 No. 1162-166, FERM-P No. 1304, ATCC No. 28159,
Arthrobacter B-1 No. 269-51, FERM-P No. 1305, ATCC No. 28158, and
Corynebacterium 18S No. 1202-138, FERM-P No. 1306, ATCC No. 21857
and being resistant to one of the metabolic antagonists consisting of:
a. L-lysine hydroxamate
b. S-(β-amino ethyl)-L-cysteine hydroxamate
c. 3-(β-amino ethyl-sulfinyl)-L-alanine (S-dl)
d. 3[S-methyl-S-(β-amino ethyl)-thio]-L-alanine
e. S-β-(2-pyridyl)ethyl-L-cysteine, and
f. S-β-(4-pyridyl)ethyl-L-cysteine
in a medium containing at least one assimilable carbon source, a nitrogen source and inorganic and growth-promoting constituents, maintaining the pH value of the culturing medium within a range of from 5 to 8.5 until a substantial amount of L-lysine is accumulated in said medium and recovering L-lysine from the medium.

3,905,868
ENZYMATIC DEACYLATION OF BENZYL- AND PHENOXYMETHYLPENICILLIN TETRAZOLES

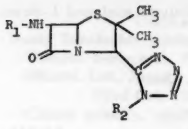
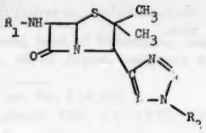
James J. Hamsher, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,480

Int. Cl.² C12D *13/02*

U.S. Cl. 195—36 P **33 Claims**

1. A process for deacylating a penicillin tetrazole selected from the group consisting of

and the salts thereof;

wherein R_1 is the acyl moiety of phenylacetic or phenoxyacetic acid;

R_2 is selected from the group consisting of hydrogen, trialkylsilyl having from one to four carbon atoms in each of said alkyl groups, alkanoyloxymethyl having from three to eight carbon atoms, 1-(alkanoyloxy)ethyl having from four to nine carbon atoms, phthalidyl and a tetrazolylpenam nitrogen protecting group;

and R_3 is selected from the group consisting of hydrogen, trialkylsilyl having from one to four carbon atoms in each of the said alkyl groups, alkanoyloxymethyl having from three to eight carbon atoms, 1-(alkanoyloxy)ethyl having from four to nine carbon atoms and phthalidyl;

said process comprising dispersing said penicillin tetrazole in water at a concentration of at least about 0.1% by weight, adjusting the pH of resulting aqueous dispersion to a value between about 5 and 9, contacting the penicillin tetrazole with a deacylase, and maintaining the pH of the solution between about 5 and 9 and the temperature between about 5° and 50°C. until the reaction is substantially complete, said deacylase being a deacylase for benzylpenicillin when R_1 is the acyl moiety of phenylacetic acid and said deacylase being a deacylase for phenoxymethylpenicillin when R_1 is the acyl moiety of phenoxyacetic acid.

3,905,869

BACILLOPEPTIDASE C, A NEW ALKALINE PROTEASE AND ITS PRODUCTION BY CULTIVATING BACILLUS BACTERIA

Hidemasa Hidaka, Yokohama; Kenji Yoshida, Kawasaki; Uichi Shibata, Tokyo; Yasukatsu Yuda, Yokohama; Tomizo Niwa, Kawasaki; Hitoshi Goi, Kawasaki; Shinji Miyado, Yokohama; Yujiro Yamada, Yokohama; Takemi Koeda, Yokohama, and Kazuo Saito, Fujisawa, all of Japan, assignors to Meiji Seika Co., Ltd., Japan

Filed Aug. 29, 1973, Ser. No. 392,426

Claims priority, application Japan, Sept. 2, 1973, 47-88137

Int. Cl.² C12D *13/10*

U.S. Cl. 195—62 **10 Claims**

10. A novel alkaline protease named Bacillopeptidase C, which is an effective anti-inflammatory agent, and which is produced by a process of (a) cultivating Bacillus sp. No. 794 (ATCC 21964 or FERM-P No. 1522) in a production medium until the said enzyme is substantially accumulated in the medium, and (b) recovering the resulting Bacillopeptidase C from the medium and which has the following properties:

1. elementary analysis : C 51.22%, H 6.92%, S 0.99%, N 16.99%, ash 1.62%;
2. molecular weight : about 27,000;
3. maximum absorption in its ultraviolet absorption spectrum at a wavelength of 280 millimicrons $E_{1cm}^{1\%}$: 12.7 (pH 6.8);
4. isoelectric point : pH 6.0;
5. specific activity : 11,400 μmg N;
6. optimal activity at a pH from 9.0 to 9.3 as indicated in FIG. **1**, at a temperature about 45°C as indicated in FIG. **3**;
7. stability in the pH range of 7 to 10.5 as indicated in FIG. **2**;
8. inhibition by ethylene-diamine tetraacetate, diisopropyl fluorophosphate or potato inhibitor but not inhibited by trypsin inhibitor, o-phenanthroline or p-chloromercuribenzoic acid.

3,905,870

PURIFICATION OF KALLIKREIN

Carl Kutzbach, and Gunther Schmidt-Kastner, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 303,615, Nov. 3, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 431,546

Int. Cl.² A61K *19/00*; C07G *7/026*

U.S. Cl. 195—62 **22 Claims**

1. A process for the purification of Kallikrein, comprising the steps of:

1. treating a crude aqueous solution containing Kallikrein with a solution of a lead or zinc salt to produce a precipitate containing Kallikrein;
2. eluting Kallikrein from said precipitate to produce a solution of Kallikrein;
3. desalinating said solution of Kallikrein to produce a desalinated solution of Kallikrein;
4. adsorbing the Kallikrein from the desalinated solution onto a macroporous anion exchange resin and eluting it therefrom to obtain an eluted solution containing Kallikrein; and thereupon
5. contacting the eluted solution with a macroporous cation exchanger; and separating said cation therefrom to produce a pure solution of Kallikrein.

20. Crystalline Kallikrein having a specific activity of about 1600 kU/mg of protein.

3,905,871

LACTAM CONJUGATES TO ENZYMES

Kenneth E. Rubenstein, Menlo Park, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned, and a continuation-in-part of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157. This application Oct. 10, 1974, Ser. No. 513,662

Int. Cl.² G01N *31/14*

U.S. Cl. 195—63 **13 Claims**

1. An enzyme-bound-ligand having a lactam functionality of the formula:

wherein:

one of the W groups is X* or a hydrogen of one of the W groups is replaced by X*;

D is hydrogen or hydrocarbyl of from 1 to 8 carbon atoms, having from 0 to 1 site of ethylenic unsaturation as the only aliphatic unsaturation;

β is H_2 or chalcogen, when α is amido and otherwise oxygen;

when other than X*, W is hydrogen and W^1 is hydrocarbyl of from 1 to 8 carbon atoms having from 0 to 1 site of ethylenic unsaturation as the only aliphatic unsaturation;

α is ethylene, amido, or imino;

A* is an enzyme bonded at other than its reactive site, having a number (n) of ligands in the range of one up to the molecular weight of A* divided by 2,000; and

X* is a bond or linking group of from 1 to 10 atoms other than hydrogen which are carbon, oxygen, and nitrogen.

3,905,872

ALKALINE PHOSPHATASE TEST MATERIAL

Peter Salvatore Forgione, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 14, 1973, Ser. No. 424,970
Int. Cl.[2] C12K 1/04
U.S. Cl. 195—103.5 R 14 Claims

1. A diagnostic test indicator for the detection and concentration determination of alkaline phosphatase in sera comprising a pair of superimposed, adhered bibulous materials the first of which contains therein, at a pH of from about 7.5 to about 12.5, the dried residue resulting from the impregnation thereof with

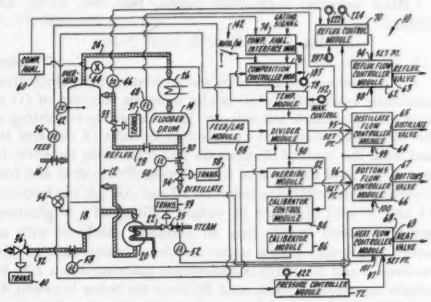
1. a naphthyl phosphate or
2. monophenyl phosphate and the second of which contains therein, at a pH of from about 2.5 to about 4.5, the dried residue resulting from the impregnation thereof with
3. a diazonium salt.

3,905,873

CONTROL APPARATUS FOR FRACTIONATION TOWER

Robert M. Wright, and Allan W. Johncock, both of Texas City, Tex., assignors to The Standard Oil Company, Chicago, Ill.

Filed Sept. 24, 1973, Ser. No. 400,000
Int. Cl.[2] B01D 3/42
U.S. Cl. 202—160 36 Claims



1. For use with a fractionation tower where feed and heat flow into the tower and the feed is distilled and separated into distillate and bottoms having different product specifications, said distillate and bottoms flowing from the tower, with a portion of the distillate being returned to the tower as reflux, and a portion of the bottoms collecting in the tower and establishing a liquid level in the tower which fluctuates within predetermined limits, control apparatus including:

reflux controller means for automatically controlling the reflux flow rate;

pressure controller means for automatically controlling the pressure within the tower;

distillate controller means for automatically controlling the distillate flow rate;

bottoms controller means for automatically controlling the bottoms flow rate;

divider means responsive to variations in the feed flow rate and feed composition for automatically controlling the distillate and bottoms controllers to adjust the distillate and bottoms flow rates and the ratio between these flow rates such that said distillate and bottoms meet product specifications despite variations in feed flow rate and feed composition; and

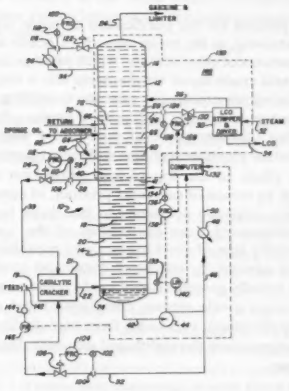
override means for automatically controlling the material balance within the tower, said override means being responsive to the fluctuations in the liquid level, and when the liquid level is in danger of exceeding said predetermined limits, said override means terminating control of the bottoms controller means by the divider means and controlling said bottoms controller means as a function of the liquid level until said liquid level is no longer in danger of exceeding said predetermined limits.

3,905,874

FRACTIONATOR COLUMN CONTROL SYSTEM

Donald E. Griffin; Byron T. Brown, both of Bartlesville, Okla., and William H. Williams, Paducah, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1972, Ser. No. 280,536
Int. Cl.[2] B01D 3/42
U.S. Cl. 203—1 4 Claims



1. The method of controlling the operation of a petroleum fractionator including a plurality of vertically disposed trays and comprising the steps of:

generating a first signal responsive to the rate of liquid flow onto a first of said trays located at a first intermediate position in said fractionator;

generating a second signal responsive to the liquid level at the bottom of said fractionator;

controlling the rate at which a bottom product of said fractionator is recycled through a heat transfer apparatus to said fractionator in response to said first signal;

controlling the rate at which fluid is withdrawn from said fractionator from a second of said trays located at a second intermediate position in said fractionator in response to said second signal; and

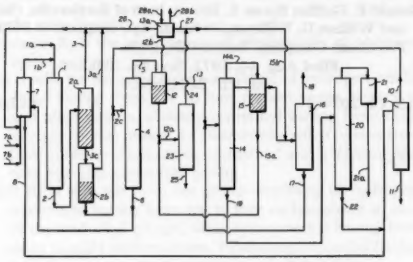
further controlling the rate at which the bottom product of said fractionator is recycled to said fractionator through said heat transfer apparatus in response to said second signal and the rate at which fluid is withdrawn from said second tray in response to said first signal to reduce the interaction between said controlling steps.

3,905,875

PROCESS FOR THE PURIFICATION OF CRUDE LIQUID VINYL ACETATE

Walter Kronig, Wiesbaden, and Wulf Schwerdtel, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 822,941, May 8, 1969, abandoned. This application Mar. 15, 1972, Ser. No. 235,089
Claims priority, application Germany, May 10, 1968, 1768412
Int. Cl. C07c 67/06
U.S. Cl. 203—71 6 Claims



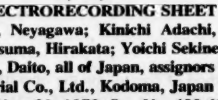
1. A process for the purification of crude liquid vinyl acetate containing, as the major impurities, acetic acid, water and small amounts of ethyl acetate, which process comprises introducing said crude liquid vinyl acetate into a single distillation, withdrawing an azeotropic mixture consisting essentially of vinyl acetate and water as the head product from said zone, separating said azeotropic mixture into a water phase and a vinyl acetate phase, recycling a sufficient quantity of said vinyl acetate phase to the top of said distillation zone to cause removal, by means of said head product, of a major portion of the water originally contained in the crude liquid vinyl acetate, withdrawing from the bottom of the zone acetic acid substantially free of vinyl acetate and containing from about 0.5 to 6 percent by weight of water and some of the ethyl acetate initially present in said crude liquid vinyl acetate, and withdrawing a side stream comprising ethyl acetate, acetic acid, vinyl acetate, and water from said distillation zone at a point intermediate the eighth and sixteenth distillation trays in said zone.

3,905,876

ELECTRORECORDING SHEET

Kimiaki Yoshino, Neyagawa; Kinichi Adachi, Takarazuka; Wataru Shimotsuma, Hirakata; Yoichi Sekine, Katano, and Toshio Shimizu, Daito, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

Filed Nov. 30, 1973, Ser. No. 420,601
Claims priority, application Japan, Nov. 30, 1972, 47-120898; Mar. 20, 1973, 48-32302
Int. Cl. B41m 5/20
U.S. Cl. 204—2 19 Claims



1. An electrorecording sheet comprising a heat sensitive color forming component for forming color or changing its color upon application of heat energy thereto, cuprous iodide for imparting conductivity and a support for carrying the above components, said electrorecording sheet for providing a recorded mark when electric current is flowed therethrough in selected areas thereof, by the fact that the heat sensitive color forming component in said selected areas forms color or changes its color, said sheet additionally comprising a resistance lowering agent for providing said cuprous iodide with a free iodine component to lower resistance of said cuprous iodide.

3,905,877

PROCESS FOR ELECTROPLATING POLYOXYMETHYLENE

Edward Johnson Deyrup, Northeast, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1974, Ser. No. 443,204
Int. Cl.² C25D 5/56
U.S. Cl. 204—30 2 Claims

1. In a process for electroplating a shaped article of polyoxymethylene by the sequential steps of etching the surface of said article with an acid etchant, neutralizing the etched surface of said article with a base solution, treating said article with a catalyst for electroless deposition, depositing by electroless plating a metal coating on said article, and depositing by electroplating a metal coating on said article, the improvement which comprises contacting said article with a liquid consisting of pyridine and up to about 75% by volume of water before etching the surface of said article.

3,905,878

ELECTROLYTE FOR AND METHOD OF BRIGHT ELECTROPLATING OF TIN-LEAD ALLOY

Nobuyasu Dohi, and Mikio Kamon, both of Kobe, Japan, assignors to Hyogo Prefectural Government, Kobe, Japan

Continuation-in-part of Ser. No. 199,396, Nov. 15, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,386
Claims priority, application Japan, Nov. 16, 1970, 45-100862
Int. Cl. C23b 5/38, 5/40, 5/46
U.S. Cl. 204—43 S 5 Claims

1. An aqueous tin-lead alloy electroplating bath electrolyte consisting essentially of an acidic aqueous solution of (i) at least one sulphonate salt selected from the group consisting of the phenolsulfonate and cresolsulfonate salts of divalent tin and lead, the total of divalent tin and lead being between 10 and 60 g/l, and the total of free phenolsulfonic acid and free cresolsulfonic acid being between 50 and 200 g/l, (ii) between 15 and 50 ml/l of a 20% by weight solution of a brightening agent prepared by reacting an aliphatic aldehyde with an aromatic primary amine under alkaline conditions, and (iii) between 2 and 20 ml/l of acetaldehyde calculated as a 20% by weight aqueous solution, said divalent tin being between 40 and 99% of the total of divalent tin and lead in the electrolyte, said brightening agent being prepared by reacting 5 moles of acetaldehyde and one mole of toluidine for 10 days at a pH between 10.0 and 10.5 and at a temperature of 15°C, and then extracting the reaction product with isopropyl alcohol.

3,905,879

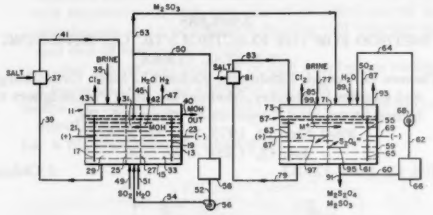
ELECTROLYTIC MANUFACTURE OF DITHIONITES

Jeffrey D. Eng, North Vancouver, and Cyril J. Harke, Burnaby, both of Canada, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,613
Int. Cl. C01b 7/06, 17/66; C01d 1/06
U.S. Cl. 204—92 12 Claims

1. A method of electrolytically manufacturing a dithionite, chlorine, a hydroxide and a sulfite from sulfur dioxide and a chloride which comprises feeding chloride solution to the anode compartment of an electrolytic cell having anode, buffer and cathode compartments separated by cation-active permselective membranes, an anode in the anode compartment and a cathode in the cathode compartment, and feeding sulfur dioxide to the buffer compartment, withdrawing chlorine from the anode compartment, hydroxide from the cathode compartment and sulfite from the buffer compartment, feeding such sulfite and sulfur dioxide to the cathode compart-

ment of a two-compartment electrolytic cell having an anode in an anode compartment, a cathode in a cathode compartment and a cation-active permselective membrane dividing



the compartments, maintaining the catholyte at pH 6–8, feeding chloride to the anode compartment thereof and withdrawing chlorine from the anode compartment and dithionite and sulfite from the cathode compartment.

3,905,880

OPERATION OF MERCURY-CATHODE CELLS

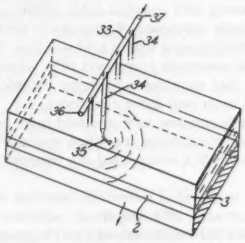
Denis Lee, and Leslie Norburn, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 29, 1974, Ser. No. 465,416

Claims priority, application United Kingdom, May 17, 1973, 23356/73

Int. Cl.[2] C25B *1/36;* **C25C** *7/00*

U.S. Cl. 204—99 **11 Claims**



1. A process for the reduction of thick mercury on the cell baseplate of a mercury cell which comprises dispersing water or an aqueous medium within the body of the amalgam intermittently or continuously at one or more stations along the line of the amalgam flow without interruption of the electrolysis.

3,905,881

METHOD FOR PRODUCING HIGH-PURITY NICKEL FROM SULPHIDIZED CONCENTRATES

Michel Bailleux, Maurepas, France, assignor to Le Nickel, Paris, France

Filed Nov. 13, 1973, Ser. No. 415,338

Claims priority, application France, Nov. 13, 1972, 72.40112

Int. Cl.[2] C25C *1/08;* **C22B** *3/00*

U.S. Cl. 204—113 **5 Claims**

1. In a method for the production of high-purity nickel from a sulphide concentrate comprising the following successive steps:

a. drying said sulphide concentrate and roasting it at a temperature of about 900°C., thereby producing sulfurous gas,

b. dissolving the roasted product in hydrochloric acid,

c. oxidizing the iron contained in the impure nickel chloride solution resulting from step (b),

d. eliminating the impurities from the nickel chloride solution on a strongly basic anion-exchange resin of the quaternary ammonium type,

e. neutralizing any excess hydrochloric acid, and

f. electrolyzing the nickel chloride solution purified in the preceding steps thereby producing gaseous chlorine and high-purity nickel, said purification step (d) being carried out using two main sets of resin columns mounted in series, said main sets of resin columns being subjected in a cyclic manner to regeneration by rinsing them with hydrochloric acid, by eluting them with water, and by restoring them to their former state using a solution of pure nickel chloride, and in which the elution solution of the first of said sets of resin columns is used for the elution of the second of said sets, then admixed with hydrochloric acid, purified on an auxiliary set of columns containing anion-exchange resin and then used successively for rinsing the second one and then the first one of said main sets of resin columns, the improvement comprising carrying out the iron oxidation step (c) by bubbling gaseous chlorine into said impure nickel chloride solution and thereafter adding sufficient hydrogen peroxide to said impure solution to bring the oxydo-reduction potential of said impure solution to the value which corresponds to the stoichiometric oxidation of the ferrous ions present in said impure solution.

3,905,882

ELECTROLYTIC ZINC SALVAGING METHOD

Harold G. Hudson, 10625 N. 37th Way, Phoenix, Ariz. 85028, and Ray Brandiff, 117 W. Aubrey, Prescott, Ariz. 86301

Filed Sept. 25, 1974, Ser. No. 509,269

Int. Cl. C22d *1/22*

U.S. Cl. 204—119 **22 Claims**

1. A continuous method for salvaging zinc from zinc-plated scrap comprising: preparing an electrowinning cell with a series of anodes and cathodes in electrical parallel; and preparing a plurality of leach tanks; charging at least two of said tanks with a solution of sulphuric acid and water and zinc; wherein the solution contains approximately 100 grams of sulphuric acid per liter of water and approximately 60 grams of zinc per liter of water; energizing said cell with electrical energy of approximately 100 amperes of current in proportion to approximately 1.2 cubic feet of solution in each leach tank; and circulating said solution progressively through said leach tanks and through said cell and back through said leach tanks to provide a continuous circuit through said leach tanks and said cell; preparing an impurities removal device in circuit with said leach tanks and said cell for removing impurities from said solution; successively placing zinc coated material in said leach tanks; circulating said solution continuously from said leach tank to said cell and plating zinc on said cathodes and recirculating the remainder of said solution back through said leach tanks; and circulating a portion of said solution through said impurities removal device and back to said cell and leach tanks.

3,905,883

ELECTROLYTIC ETCHING METHOD

Masanobu Hanazono, and Osamu Asai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed June 18, 1974, Ser. No. 480,472

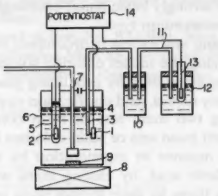
Claims priority, application Japan, June 20, 1973, 48-68734

Int. Cl. B23p *1/00*

U.S. Cl. 204—129.65 **7 Claims**

1. An electrolytic etching method for etching precise electrical parts, wherein a 0.1 to 2.5 mol/l concentration ammonium persulfate - 0.02 to 10 mol/l concentration nitric acid electrolyte is used and a DC voltage is applied between a cathode electrode of insoluble metal and an anode electrode

including a metal object to be etched, said metal object being made from a member selected from the group consisting of iron, nickel, cobalt, copper and alloys thereof, whereby a



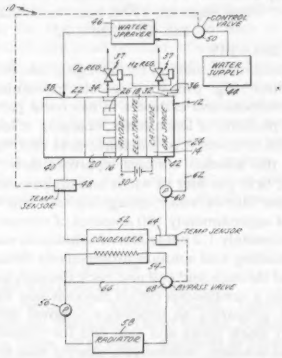
constant potential electrolytic etching is performed by maintaining the anode electrode potential between the natural electrode potential and the oxygen creation potential of said objects to be etched.

3,905,884

ELECTROLYSIS CELL SYSTEM INCLUDING RECIRCULATING PRODUCT GAS STREAM FOR COOLING THE CELL

Edmund K. Parenti, Jr., Manchester; David P. Bloomfield; Paul E. Grevstad, both of West Hartford, all of Conn., and Daniel W. Beal, San Francisco, Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,610
Int. Cl. C25b *1/02*; H01m *8/08*
U.S. Cl. 204—129 **19 Claims**



10. In the process of generating hydrogen gas and oxygen gas in an electrolysis cell wherein the cell includes a pair of gas diffusion electrodes spaced apart, matrix means for retaining an aqueous electrolyte in the space between said electrodes, means forming a hydrogen gas space on the nonelectrolyte side of one of said pair of electrodes and an oxygen gas space on the nonelectrolyte side of the other of said pair of electrodes, and a thermal exchange portion, the steps of:

supplying current to said cell;

recirculating a portion of one of said product gases from its respective gas space through said thermal exchange portion and back through said gas space;

introducing water into said recirculating product gas for removing heat from said cell, said water being introduced in an amount sufficient to maintain the temperature of said stream exiting from said thermal exchange portion at a predetermined temperature;

condensing vaporized water entrained within said recirculating gas after it exits from said thermal exchange portion and prior to its being reintroduced into said gas space for removing heat therefrom; and

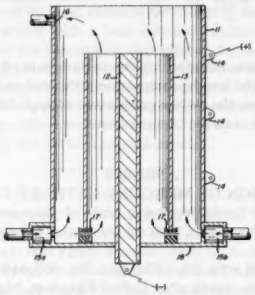
establishing a desired partial pressure of water vapor in said recirculating gas as it reenters said gas space.

3,905,885

METHOD FOR THE ELECTROLYTIC CONDITIONING OF METAL TUBES

Thomas G. Bengel, Pittsburgh; Richard L. Sallo, Greensburg, and Charles D. Stricker, Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed June 13, 1973, Ser. No. 369,643
Int. Cl.[2] C25F *3/00*, *5/00*
U.S. Cl. 204—129.43 **4 Claims**



1. A method for the electroconditioning of a stainless steel tube, which comprises,

axially disposing said stainless tube within an outer, tube-like electrode composed of a relatively insoluble material and axially disposing within said stainless tube, an inner, cylindrical electrode composed of a relatively insoluble material, said stainless tube being electrically insulated from said inner and outer electrodes,

immersing said stainless tube and said inner and outer electrodes in an electrolyte consisting essentially of 20 to 60 wt. percent H_2SO_4 maintained at a temperature of 110° to 175°F,

establishing a potential difference between said inner and outer electrodes, of a magnitude sufficient to effect the passage of a current density of 2 to 15 amperes per square inch, while causing said electrolyte to flow in the annular spaces between said electrodes and said stainless tube at a rate sufficient to support said current density, whereby the current is caused to pass substantially radially between the inner and outer electrodes through said tube and the electrolyte in the annular spaces between said electrodes and said tube, and the surface of said tube facing the more negative of said electrodes will be dissolved and conditioned.

3,905,886

ULTRAFILTRATION AND ELECTRODIALYSIS METHOD AND APPARATUS

Donald G. J. Wang, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Sept. 13, 1974, Ser. No. 505,563
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P **26 Claims**

1. The combination of:

an enclosure including means for supporting a plurality of membranes disposed in spaced relation to form a plurality of filtration cells within said enclosure,

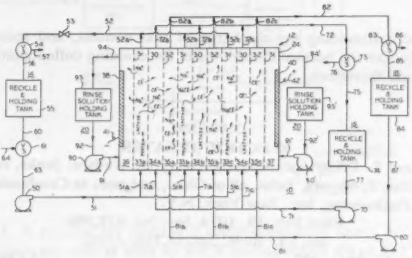
electrode means disposed in spaced relation relative to the sides of said membranes, for supplying an electric field there across,

at least a first one of said membranes being selective to ions having one charge and at least a second one of said membranes being selective to ions of an opposite charge, and an ultrafiltration membrane disposed between said ion selective membranes to define at least one ultrafiltration cell therebetween with one side of said first one of said membranes and a permeate collecting cell with the second one of said membranes,

the other side of said first one of said membranes defining a marginal side of an electrode cell and

means for delivering fluid under pressure to at least said ultrafiltration cells.

14. A filtration process comprising:



providing a filtration system including at least one ultrafiltration cell pair which is defined by an ultrafiltration membrane being disposed between a pair of ion selective membranes, a first one of which is at least anion-permeable and the other of which is at least cation-permeable,

applying an electric field across said cell pair, the cathode being arranged on the side of said housing said first ion-permeable membrane, and

injecting a fluid to be simultaneously ultrafiltered and deionized under pressure into a first cell of said cell pair formed by said ultrafiltration membrane and one of said ion selective membranes, whereby ionic constituents of said fluid are drawn out of said cell pair toward one direction relative to said field and whereby permeate is forced through said ultrafiltration membrane into the second cell of said cell pair.

3,905,887

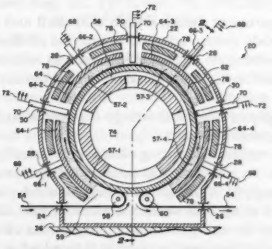
THIN FILM DEPOSITION METHOD USING SEGMENTED PLASMA

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 322,968, Jan. 12, 1973, Pat. No. 3,829,373. This application Jan. 25, 1974, Ser. No. 436,444

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 **13 Claims**



1. Method of coating a thin film on elongate substrate means by plasma vapor deposition in a pressure vessel which comprises:

A. forming a plurality of plasma vapor cloud segments into an arcuate belt within the vessel,

B. moving the substrate means from the exterior of the belt into the interior thereof,

C. moving the substrate means while within said belt on a path which has an arcuate configuration and is in substantial conformation to the inner radial arcuate configuration of the belt, the substrate means having a convex surface while in said arcuate configuration path which forms an interface between the belt and the substrate means and

D. moving the substrate means out of said belt.

3,905,888

ELECTROCHEMICAL SENSOR

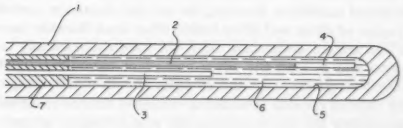
Wolfgang Mindt, Erlangen, Germany, and Willy Fehlmann, Muttenz, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 29, 1974, Ser. No. 465,191

Claims priority, application Switzerland, May 10, 1973, 6642/73

Int. Cl.[2] **G01N** *27/46*

U.S. Cl. 204—195 P **2 Claims**



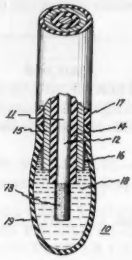
1. An electrochemical sensor for determining the oxygen partial pressure, in which two electrodes are disposed in a chamber which contains an electrolyte and the walls of which are permeable to oxygen, comprising the chamber being defined by the interior of a tube made of a flexible material permeable to oxygen, and which chamber is partially filled with a sealing compound and closed at the end thereof which contains the electrolyte, the electrodes including a pair of wires parallel to the longitudinal axis of the tube which are partially embedded in the sealing compound, their ends projecting two different distances into the interior of the tube and a longitudinal portion of each end being in contact with the electrolyte, the longer one of said wires having an insulating layer in the region over which the shorter wire extends, the active surfaces of the electrodes being formed by the non-insulated surfaces of the wire ends which face the inner surface of the body.

3,905,889

MINIATURE MULTIFUNCTIONAL ELECTROCHEMICAL SENSOR FOR SIMULTANEOUS CARBON DIOXIDE-pH MEASUREMENTS

Robert A. Macur, Milwaukee, Wis.; Oliver H. LeBlanc, Jr., and Willard T. Grubb, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,798
Int. Cl. G01n 27/30, 27/46
U.S. Cl. 204—195 M 4 Claims



1. A miniature probe containing a hydrogen ion sensing electrode and a carbon dioxide sensor which comprises a flexible, elongated electrode lead, the electrode lead comprising a metallic base member, an electrochemically active region showing electrochemical response to pH changes adhering tightly to and in electrical contact with one end portion of the base member of the electrode lead, and electrical insulation surrounding the base member thereby forming a hydrogen ion sensing electrode; a second metal electrode lead spaced from the base member of the first electrode lead by the electrical insulation thereon, the second electrode containing a region of silver and silver halide other than fluoride thereon, an electrolyte contacting both the electrochemically active region and at least the silver and silver halide region of the second electrode lead, and an outer sheath of a hydrogen ion and carbon dioxide permeable diffusion barrier material encapsulating the electrochemically active region, at least the silver and silver halide region of the second electrode lead, and the electrolyte thereby forming a carbon dioxide sensor, the diffusion barrier material being a hydrophobic elastomer polymer with a dielectric constant of from 4 to 13 containing a hydrophobic and lipophilic H+ ion carrier.

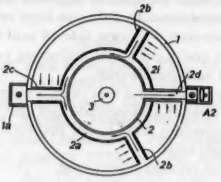
3,905,890

METHOD AND APPARATUS FOR PURIFYING WASTE WATER

Toyomasa Minegishi, 1108,3-21-20, Nishiazabu, Minato-ku, Tokyo, Japan

Division of Ser. No. 352,281, April 18, 1973. This application Apr. 19, 1974, Ser. No. 462,532
Claims priority, application Japan, Dec. 20, 1972, 47-2358
Int. Cl.² C02B 1/82; C02C 5/12
U.S. Cl. 204—276 7 Claims

1. An apparatus for purifying water comprising a vessel for the water to be purified, having an inner wall, a central vertically arranged tubular conduit within said said vessel spaced inwardly from said inner wall and having an upper end with a discharge into said vessel, a positive and a negative electrode arranged in spaced relationship within said conduit adjacent the lower end thereof, means for supplying a potential to said electrodes to produce an electrolysis in said conduit to form hydrogen and oxygen, means for supplying electrolyte to said conduit adjacent the lower end thereof, means for circulating waste water to be treated into said conduit above the electrolyte and in the vicinity of said electrodes to cause a newly formed hydrogen and oxygen therein to promote the formation of nuclei for the coagulation of the waste material into flock, said vessel having an overflow for the continuous overflow of flocculated waste and water adjacent the top thereof



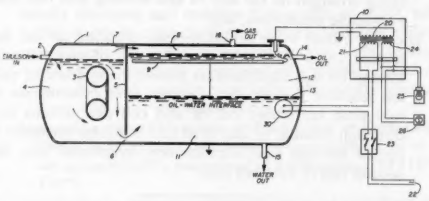
and surrounding the discharge of said conduit, and means adjacent the bottom of said vessel for draining deflocculated liquid therefrom.

3,905,891

ELECTRIC TREATER

Floyd L. Prestridge, Mounds; Harry G. Wallace, Jenks, and Rex T. Meyers, Tulsa, all of Okla., assignors to Combustion Engineering, Inc., New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 438,986
Int. Cl.² B03C 5/02; C10G 33/02
U.S. Cl. 204—305 1 Claim



1. A System for supplying thermal and electrical energy for dehydrating oil field emulsions, including:

a. A Shell connectable to a supply of produced oil field emulsion and in which the emulsion is treated into oil and water,

b. compartment means within said shell and containing an electrode system adapted to provide an electrostatic field for forming an oil-water interface in said compartment,

c. a transformer connected by its secondary to said electrode system,

d. a supply of electrical energy connected to the primary of said transformer,

e. and a resistance heating element electrically connected in series circuit with said primary of said transformer and said supply of electrical energy and adapted to be positioned at said oil-water interface in said compartment,

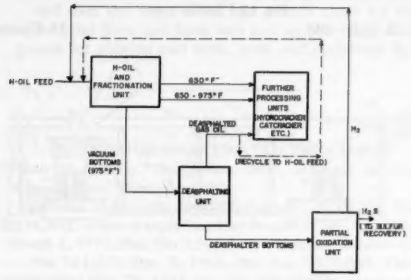
whereby an increase in conductivity in the electrode system first causes an increase in current flow which is limited by the included resistance heating element while the resulting increase in thermal output from the resistance heating element into the material at the interface then causes a lowering of the conductivity in the electrode system.

3,905,892

PROCESS FOR REDUCTION OF HIGH SULFUR RESIDUE

Armand A. Gregoli, Somerville, N.J., and George R. Hartos, Paoli, Pa., assignors to Cities Service Research & Development Co., Cranbury, N.J.

Continuation-in-part of Ser. No. 230,910, March 1, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,531
Int. Cl. C10g *13/02*
U.S. Cl. 208—95 3 Claims



1. A process for treating a sulfur-containing heavy hydrocarbon oil, with at least 95 vol.% boiling above about 975°F., to obtain essentially only low-sulfur hydrocarbon products boiling below 975°F., said process comprising, in combination:

a. hydrocracking and hydrodesulfurizing said heavy hydrocarbon oil with hydrogen in a hydrogen refining zone, at a pressure from about 1,000 psi to about 4,000 psi and a temperature of between 650°F. and 950°F. by passing said oil and hydrogen upwardly through a particulate catalyst bed in said zone, thus maintaining the catalyst bed in an expanded state to obtain a hydrorefined oil;

b. fractionating the hydrorefined oil, obtaining therefrom at least one fraction boiling above about 975°F. and at least one fraction boiling below 975°F.;

c. solvent deasphalting said fraction boiling above about 975°F. to give a deasphalted gas oil and a raffinate;

d. partially oxidizing said raffinate to extinction, to obtain a hydrogen stream therefrom equivalent in quantity to that used in step (a), and

e. recycling the hydrogen from step (d) to step (a).

3,905,893

PLURAL STAGE RESIDUE HYDRODESULFURIZATION PROCESS

Robert D. Christman, Pittsburgh; Alfred M. Henke, Springdale; John A. Paraskos, Pittsburgh; Geoffrey R. Wilson, Pittsburgh, and Stephen J. Yanik, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 22, 1973, Ser. No. 390,362
Int. Cl.² C10G *34/00*
U.S. Cl. 208—210 6 Claims

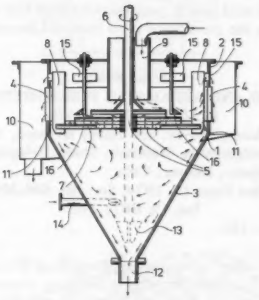
1. A process for hydrodesulfurizing a feed residual petroleum oil containing asphaltenes, metals and sulfur to a substantially asphaltene-free oil without a distillation or solvent extraction step for removal of asphaltenes comprising passing said feed oil and hydrogen through a plurality of hydrodesulfurization stages in series including an initial stage and a final stage each operating at a temperature between about 650° and 800°F., each stage employing a catalyst comprising Group VI and Group VIII metals on alumina, increasing the temperature in each stage with increasing catalyst age to compensate for catalyst activity aging loss, maintaining a lower hydrogen pressure in said final stage than in said initial stage, removing asphaltenes, metals and sulfur from the feed oil in said initial and said final stages with a greater amount of metals and sulfur being removed from the feed oil in said initial stage than in said final stage, operating said final stage at a hydrogen pressure between 1,300 and 1,900 psi and operating said initial stage at a hydrogen pressure up to 2,300 psi which is higher than the pressure in said final stage so that the ratio of percent demetallization to percent desulfurization is higher in the final stage than in the initial stage, the catalyst in said final stage comprising a higher weight percent of Group VI and Group VIII metals than the catalyst in said initial stage so that the final stage produces a substantially asphaltenefree hydrodesulfurized effluent comprising more than 80 volume percent yield boiling above the gasoline range based on feed.

3,905,894

APPARATUS FOR WET FINE SCREENING

Risto Tapani Hukki, Otaniemi, Finland, assignor to Murskauskone Oy, Salpakangas, Finland

Filed Oct. 2, 1973, Ser. No. 402,831
Int. Cl.² B03B *7/00*
U.S. Cl. 209—17 8 Claims



1. Apparatus for wet fine screening of finely divided solids in pulp comprising:

a screening vessel including an upper section having screen means defining a screening zone in which the fine product is produced and a bottom section for collecting the settling product,

means for feeding the pulp to be processed into said vessel, drive means, a plurality of blades in said upper section of said vessel attached to said drive means and rotated thereby at a distance from said screen means to produce the fine product from the pulp at the screening zone,

means for collecting the fine product from the screening zone,

a distribution member rotated by said drive means between said upper section and said lower section, said distribution member including a plurality of plates stacked above one another to form at least one free space therebetween, means for passing the uncollected settling product from said screening zone to said lower section, and an opening in the lowermost plate communicating with said space for returning at least a portion of the settling product from said lower section through said opening and said space to said screening zone.

3,905,895

FECAL EGG SEPARATOR

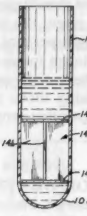
Tim Addis, Rural Rt. No. 2, Ava, Mo. 65608

Filed Nov. 23, 1973, Ser. No. 418,182
Int. Cl.² B03B *7/00*
U.S. Cl. 209—17 5 Claims

5. A device for collecting fecal material and receiving a solution added to said fecal material for the purpose of segregating the ova contained therein, said device comprising:

a hollow receptacle for collecting and transporting said fecal material and for containing said solution, said recep-

tacle having an open top end and a closed bottom end, said bottom end being integral with said receptacle to prevent the leakage of said solution therefrom; and



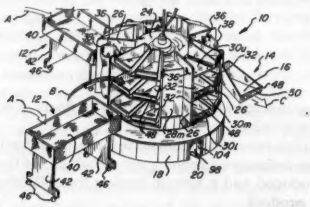
a filter in the form of a generally spherical shell sized to fit closely within said receptacle, said spherical shell having a hollow interior and presenting a plurality of holes sized to permit said ova to pass therethrough but substantially impeding the passage of fecal material therethrough.

3,905,896

METHOD AND APPARATUS FOR SORTING AND DISTRIBUTING MAIL

Harry L. Jackson, Denver, and Harry R. Boyd, Arvada, both of Colo., assignors to Mountain States Telephone & Telegraph Company, Denver, Colo.

Filed Sept. 16, 1974, Ser. No. 506,309
Int. Cl. B07c 7/02
U.S. Cl. 209—124 **22 Claims**



1. Apparatus for sorting mail which comprises: a stationary base; a movable subassembly mounted atop the base for rotational movement about a vertical axis, said subassembly including a plurality of radially-extending partition walls driving the exterior thereof into compartments, horizontally-disposed shelves bridging the space separating at least some of the adjacent partition walls subdividing the compartment defined therebetween into two or more pigeonholes arranged one above another in tiered relation, and drawer-like mail-receiving bins removably mounted within the pigeonholes; friction drive means for rotating the movable subassembly including a motor carried by one of said base and movable subassembly elements and a driven friction wheel in continuous driving engagement with the other of said elements; and, friction brake means for preventing relative movement between said base and rotating subassembly including brake shoe forming means carried by one of said base and rotating subassembly elements in continuous contact with the other of said elements, said friction brake means being automatically operative to override the friction drive means and stop the rotating subassembly when the speed of the latter is slowed down below a predetermined level, and said friction drive means being automatically operative to override said friction brake means and keep said rotating subassembly turning when the speed thereof exceeds said predetermined level.

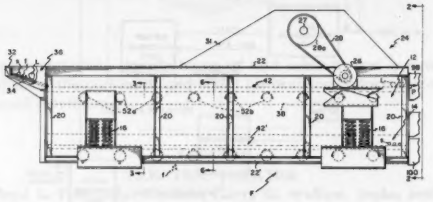
18. In the method for sorting mail wherein the mail to be sorted is sorted according to addressee and placed in pigeonholes corresponding to said addressee, the improvement which comprises circulating said pigeonholes repeatedly past a fixed sorting station where the operator can stay in one place and sort the mail into the appropriated pigeonholes as they move past.

3,905,897

MATERIAL CLASSIFYING APPARATUS

Wayne D. Jacobson, Owosso, Mich., assignor to Simplicity Engineering Company, Durand, Mich.

Filed July 9, 1973, Ser. No. 377,592
Int. Cl.² B07B 1/46
U.S. Cl. 209—405 **11 Claims**



2. In an apparatus for grading or classifying abrasive material, such as crushed ore or the like, into coarse and finer components having an oscillating conveyor means including a generally horizontally disposed rectangular frame, a classifying screen mounted upon said frame, drive means for oscillating said frame and said screen to convey material across said screen from one end to the other while passing the finer components of said material downwardly through the openings in said screens;

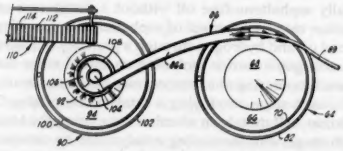
the improvement comprising a support deck fixedly mounted on said frame and including a plurality of spaced parallel rigid tubular support members fixedly mounted upon said frame in underlying relationship to said screen with said support members extending transversely of the direction of movement of material across said screen, resilient shield means overlying a first group of said support members at the upstream end of said screen with respect to the direction of travel of material thereacross, and hardened metallic shield means fixedly to and overlying the remainder of said support members, both of said shield means being operable to protect the support members against the abrasive action of material passed downwardly through said screen.

3,905,898

PROCESS AND APPARATUS FOR RECLAMATION OF ABRASIVE GRIT

Edward L. Jackson, 215 Terrace Dr., Pauls Valley, Okla. 73075

Division of Ser. No. 204,420, Dec. 3, 1971, Pat. No. 3,802,916.
This application Dec. 26, 1973, Ser. No. 427,639
Int. Cl.² B03B 5/74
U.S. Cl. 209—444 **2 Claims**



1. A separatory device for hydraulically separating abrasive grit materials comprising:

a flotation table having an upwardly facing surface;

a cone positioned centrally on said flotation table and having its apex centered over said table;

a peripheral lip secured to the outer periphery of said table and projecting upwardly therefrom for confining liquid on said table to a certain depth;

a chute of U-shaped cross section having an open intake end immediately adjacent the upwardly facing surface of said table inside said lip and extending upwardly therefrom over said lip and thence downwardly from said lip;

downwardly directed fluid jet means positioned adjacent and over the open intake end of said chute for moving material from said table into and up said chute; and

means for rotating said table, cone and peripheral lip.

3,905,899

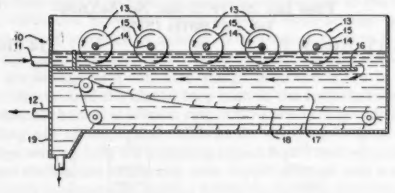
METHOD OF WASTEWATER TREATMENT

Wilbur N. Torpey, Douglaston, N.Y., assignor to Autotrol Corporation, Milwaukee, Wis.

Division of Ser. No. 306,584, Nov. 15, 1972, Pat. No. 3,776,841, which is a continuation-in-part of Ser. No. 122,618, March 1, 1971, Pat. No. 3,703,238, which is a division of Ser. No. 781,452, Dec. 5, 1968, Pat. No. 3,575,849. This application May 29, 1973, Ser. No. 364,508The portion of the term of this patent subsequent to Apr. 20, 1988, has been disclaimed.

Int. Cl.[2] C02C *1/10*

U.S. Cl. 210—14 **5 Claims**



1. Method for the continuous treatment of wastewater comprising

a. providing a treatment tank having a biological treatment zone in its upper portion and a settling zone in its lower portion,

b. said settling zone being subjacent to and substantially coextensive with said biological treatment zone,

c. introducing wastewater into said biological treatment zone,

d. maintaining a predetermined depth of wastewater in said treatment tank,

e. creating a flow of substantially all of said wastewater through said biological treatment zone,

f. creating a flow of wastewater through said settling zone counter to the direction of wastewater flow in said biological treatment zone,

g. said biological treatment zone including a plurality of rotatably mounted parallel shafts mounted across said treatment tank transverse to the direction of wastewater flow and a plurality of disc members mounted on each of said parallel shafts and extending into said wastewater and,

h. rotating said disc members at a peripheral velocity adequate to permit the growth of aerobic biological slimes on the surface of said disc members.

3,905,900

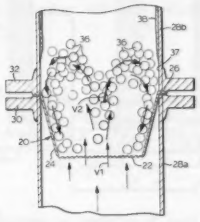
METHOD FOR CONTACT BETWEEN FLUIDS

James W. Gulyas, and Charles Vydra, both of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Division of Ser. No. 227,458, Feb. 18, 1972, Pat. No. 3,771,657. This application July 3, 1973, Ser. No. 376,266

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—20 **2 Claims**



1. A process for treating an aqueous ammoniacal ammonium carbonate solution containing dissolved basic nickel carbonate in order to continuously precipitate said basic nickel carbonate and to remove ammonia and carbon dioxide therefrom which process comprises the following steps: introducing said solution downwardly through a substantially horizontal foraminous divider of a first partition into a confined gas-liquid contact zone having a side limit defined by an interior wall, an upper limit defined by said first partition and a lower limit defined by a second partition having a substantially horizontal foraminous divider, said dividers both being spaced apart from said interior wall, said first and second partitions also having imperforate frustoconical wall elements which slope upwardly and outwardly from the dividers and terminate at said interior wall; introducing a gas upwardly through the divider of said second partition into said zone such that upward flow of said gas and downward flow of said solution are established in the central region of said zone; maintaining the temperature of said gas at a sufficiently high level to heat the solution within said zone and to cause ammonia and carbon dioxide contained in the last-mentioned liquid to evolve and basic nickel carbonate dissolved therein to precipitate; confining in said zone a plurality of light-weight spheres movable freely throughout the lower region of said zone; directing the downward flow of solution such that it passes wholly through each said divider, into the central region of the zone therebeneath and away from the area of the interior wall defining the upper region of said zone and adjusting the velocity of said gas below that at which said gas carries said solution upwardly and such that the velocity is highest as the gas passes upwardly through each said divider and the velocity decreases at a uniform rate upwardly therefrom and thereby lifts any spheres in contact with said divider and carries said spheres predominantly upwardly and towards the next higher said divider until the gas stream velocity is no longer sufficient to lift said spheres whereupon said lifted spheres cease their ascent predominantly in the lower region of said zone and well short of said next higher divider and move downwardly and outwardly of said central region thereby scouring the interior wall and the imperforate frustoconical wall elements.

3,905,901

PROCESS FOR REMOVING HYDROCARBONS AND OTHER ORGANIC PRODUCTS FROM AQUEOUS FLUIDS

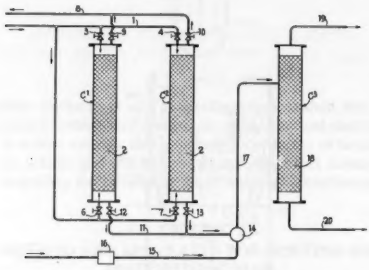
Aldo Tribellini, St-Chamond, France, assignor to Creusot-Loire, Paris, France

Filed Mar. 25, 1974, Ser. No. 454,771

Claims priority, application France, Mar. 28, 1973, 73.11063

Int. Cl.[2] B01D *11/04*

U.S. Cl. 210—21 10 Claims



1. A process for removing hydrocarbons contained in an aqueous fluid, such as waste water or an industrial aqueous effluent, comprising intimately mixing with the effluent a hydrocarbon solvent insoluble in water, and passing the mixture obtained through a bed of a solid complex consisting essentially of a solid substrate bearing free hydroxyl groups activated with 0.01 to 10 parts by weight of an acid halide per one part of said substrate and to which is covalently bound from 0.01 to 10 parts by weight of an amine selected from the primary aliphatic amines having from 6 to 20 carbon atoms and the primary aromatic amines having, attached to a phenyl ring, a linear hydrocarbon chain of 1 to 10 carbon atoms bearing the amine group, thereby separating the hydrocarbon solvent containing said hydrocarbons from the purified effluent.

3,905,902

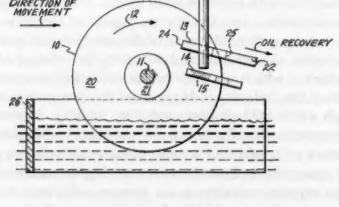
RECOVERY OF OIL AND OIL-SOLUBLE CONTAMINANTS FROM THE SURFACE OF WATER

Ruth G. Hoegberg, 209 Matroy Ln., Wallingford, Pa. 19086, and Walter S. Tyler, Valley View, R.D. No. 1, Landisburg, Pa. 17040

Continuation-in-part of Ser. No. 180,729, Sept. 15, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,683

Int. Cl.[2] B01D *15/00*

U.S. Cl. 210—30 10 Claims



1. A method of recovering oil or oil-soluble contaminants from the surface of water while minimizing the simultaneous pickup of water consisting of partially immersing in the water a plurality of discs of hydrophobic dielectric polymer which are electrostatically isolated from grounded conductors in contact with the water, rotating said discs so that the rim portion of the discs is moved through the water to pick up oil or oil-soluble contaminants floating thereon, and frictionally wiping said discs to remove all of the picked up material therefrom in the area of contact, the frictional wiping contact and the speed of rotation of said discs triboelectrically establishing and said electrostatic isolation maintaining a negative electrostatic charge on each of said discs.

9. Apparatus for recovering oil or oil-soluble contaminants from the surface of water consisting of a plurality of discs of hydrophobic dielectric polymer which are electrically isolated from grounded conductors in contact with the water, means to partially immerse said discs in a body of water, means to rotate said discs to move the rim portion of the discs through the water, a wiper frictionally engaging the rim of each of the discs to remove all of the oil or oil-soluble contaminants carried thereon in the area of contact therebetween, said wipers being made of a material which, when they rub against said rims, will impose a negative electrostatic charge on each of said discs, the frictional wiping contact between the wipers and the discs and the speed of rotation of the discs being adapted to triboelectrically establish a negative electrostatic charge on each of said discs which is maintained by said electrical isolation, and means to apply oil to the rim of the discs, said oil-applying means being positioned between said wiper and the point where said rim is reimmersed in said water.

3,905,903

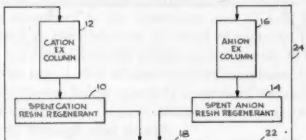
METHOD OF PURIFICATION OF CATION REGENERANT SOLUTION

Ernest J. David, Fair Oaks, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Jan. 24, 1975, Ser. No. 543,656

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C 14 Claims



1. A method of separating an ion-exchange regenerant from a solution containing a complex of said regenerant with a counter-ion regenerant comprising the steps of:

passing said solution through a chromatographic media capable of resolving said regenerant from the complex;

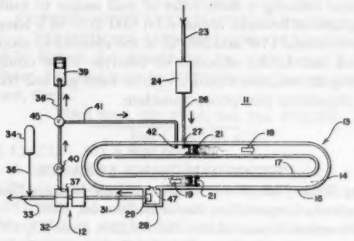
passing eluant through the media to form a regenerant cut and a complex cut; and

separating the regenerant eluate cut from the complex eluate cut.

3,905,904
INSTALLATION FOR SEWAGE TREATMENT

Lloyd G. Cherne, Edina; Harry Cleveland Grounds, St. Paul, and Halvor O. Halvorson, Minneapolis, all of Minn., assignors to Cherne Industrial, Inc., Edina, Minn.

Filed Oct. 1, 1973, Ser. No. 402,327
Int. Cl.² C02C 1/08; C02B 3/08
U.S. Cl. 210—195 6 Claims



1. A sewage treatment installation comprising an open-topped activated sludge sewage aeration treatment channel having a bottom and sides forming an endless closed loop path which provides a variable volume activated sludge treatment reservoir for containing and treating a mixed liquor of sewage and activated sludge including microorganisms and suspended solids, a delivery device for delivering sewage, which is at most partially treated, into the activated sludge treatment channel at one location along the path at variable volume rates which can change from moment to moment during a predetermined daily time period and which generally correspond to the normal variations in volume rates at which such sewage is received from a source of sewage to be treated, such as a raw sewage collection system, a device for continuously circulating the sewage with activated sludge as mixed liquor in one direction around the closed loop path in the activated sludge treatment channel at a linear rate of flow preventing undesired settling out of suspended solids in the channel, at least one sludge settling tank for receiving mixed liquor and separating it into sludge and remaining clear liquid effluent, and a substantially constant rate feeding device for feeding mixed liquor from a second location along the path in the activated sludge treatment channel to such sludge settling tank during such predetermined daily time period at a substantially constant volume rate at least equal to the average of the variable volume rates at which the sewage is initially delivered by the delivery device to the activated sludge treatment reservoir during such period, said installation including means for aerating the mixed liquor in the aeration treatment channel and overflow means for feeding mixed liquor from the treatment channel to the sludge settling tank at a higher rate than said substantially constant volume rate whenever the depth of the liquor in said channel exceeds a predetermined maximum level to prevent the channel from overflowing into any adjacent land area.

3,905,905
FILTER UNIT

Stephen H. O'Leary, San Diego, and Paul J. Melton, Carlsbad, both of Calif., assignors to IVAC Corporation, La Jolla, Calif.

Filed Jan. 11, 1974, Ser. No. 432,466
Int. Cl.² B01D 35/00
U.S. Cl. 210—436 16 Claims

16. A filter unit for the filtration of parenteral fluid during the intravenous administration thereof comprising:

an upper and lower housing defining a chamber;

a porous filter disposed between said upper and lower housings separating said chamber into an upper filter chamber and a lower filter chamber;

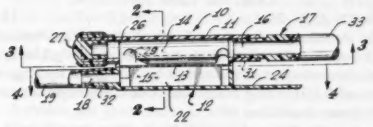
an inlet port in said upper housing in communication with said upper filter chamber;

a central channel in said upper housing communicating therewith along substantially its entire length;

an air extraction port in said upper housing communicating with said central channel;

a peripheral channel disposed on each side of said central channel and communicating therewith adjacent said air extraction port, a portion of the length of said peripheral channel adjacent the point of communication with said central channel being biased with respect to said central channel for funneling entrapped air to said central channel, said peripheral channels being open to said upper filter chamber along substantially their entire length;

said lower housing comprising a base carrying a wall member defining the peripheral wall and the interior of said lower filter chamber, said wall member provided with an



opening defining an outlet port, said wall member adjacent either side of said outlet port being biased with respect to the axis of rotation of said outlet port so as to define in plan configuration a funnel for directing fluid out of said lower filter chamber;

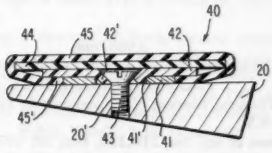
a plurality of spaced apart upstanding, parallel elongated ribs disposed on said base in the interior of said lower filter chamber, said ribs disposed so that the longitudinal axes thereof are parallel to the axis of rotation of said outlet port and the spaces between said ribs defining channels for the passage of fluid to said outlet port, the upper edges of said ribs defining a support surface for said filter that slopes downwardly from the interior of said lower filter chamber in a direction normal to the longitudinal axes of said ribs; and

a flange carried by said base for securing said filter unit adjacent the area of intravenous administration.

3,905,906
ANTI-FRICTION DEVICE FOR SAFETY SKI BINDING

James M. Edmund, 5262 Olde Stage Rd., Boulder, Colo. 80302

Filed Sept. 18, 1973, Ser. No. 398,445
Int. Cl.² A63C 9/00
U.S. Cl. 280—11.35 C 25 Claims



1. An anti-friction device for supporting the sole of a ski boot on a ski for purposes of minimizing variations in the friction forces under all skiing conditions, comprising a first washer means provided with a substantially centrally located hole, further means having low friction surfaces and of larger diametric dimension than said first washer means and including at least a second washer means, means including a threaded member for holding said first washer means and at least a part of said further means fixedly with respect to the ski, and outer encapsulating means of resilient material which

has its peripheral edge portions folded over and tucked under the further means to thereby provide a moisture- and dirt-proof assembly by the sealing action of the resilient material of the encapsulating means in conjunction with the clamping action of the tightened threaded member.

3,905,907

SOLUTIONS FOR CHEMICAL DISSOLUTION TREATMENT OF METAL MATERIALS

Shoji Shiga, Nikko, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,827

Claims priority, application Japan, Dec. 22, 1972, 47-129102

Int. Cl.² C23F *3/02, 3/04*

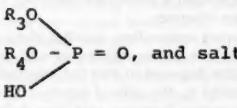
U.S. Cl. 252—79.4 **15 Claims**

1. A solution for the chemical dissolution treatment of metal materials comprising water, 0.1 to 10 g/l in hydrogen-ion concentration of an acid, 0.1 – 300 g/l of hydrogen peroxide and 0.001 – 20 g/l of at least one compound selected from the group consisting of

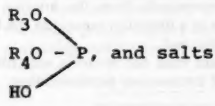
a. an alcohol polyoxyethylene ether represented by the formula

$$R_1O(C_2H_4O)_nH,$$

b. an alkyl hydrogen phosphate represented by the formula



c. an alkyl hydrogen phosphite represented by the formula



wherein R_1 is an aliphatic hydrocarbon residue having 4 to 20 carbon atoms, n is an integer of 2 to 20, R_3 is an alkyl or hydroxyalkyl group, each having 1 to 12 carbon atoms, and R_4 is hydrogen, or an alkyl or hydroxyalkyl group, each having 1 to 12 carbon atoms.

3,905,908

LUBE OIL CONTAINING OLIGOMERIC PHOSPHORODIAMIDATE

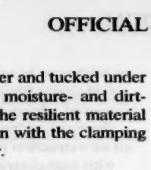
Haakon Haugen, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 210,238, Dec. 20, 1971, Pat. No. 3,810,838. This application Sept. 19, 1973, Ser. No. 398,614

Int. Cl.² C10M *1/10*

U.S. Cl. 252—49.9 **2 Claims**

1. A hydrocarbon lubricating oil composition comprising a major amount of hydrocarbon lubricating oil and between about 0.1 and 10 wt. percent of a product of an oligomeric O-alkyl-N,N'-bis(alkaryl) phosphorodiamidate having an average from 1 to 4 phosphorodiamidic groups and a phosphorus content of between about 2 and 10 wt. percent prepared by the method comprising contacting an amine of the formula RNH_2 where R is alkaryl of from 12 to 24 carbons with an alkyl dihalophosphate of the formula:



where R' is alkyl of from 2 to 6 carbons and X is chlorine or bromine utilizing a mole ratio of said amine to said dihalophosphate of between about 1.7:1 and 2.3:1 at a temperature between about 170° and 200°C. in the absence of inert diluent solvent and in the absence of catalyst while continuously blowing the reaction mixture with an inert gas and recovering said oligomeric phosphorodiamidate.

3,905,909

PHYTOTOXIC DRAIN CLEANER

Henry Bauer, Miraleste, Calif., assignor to Days-Ease Home Products Corporation, North Hollywood, Calif.

Continuation-in-part of Ser. No. 49,180, June 23, 1970. This application June 4, 1973, Ser. No. 366,312

Int. Cl.² C11D *7/06, 3/60*

U.S. Cl. 252—156 **13 Claims**

1. A drain cleaning and scale and soap removing composition comprising:

an alkali metal hydroxide in an amount sufficient to provide a pH of about 13 to 13.5 when said composition is added to a drain system;

a water soluble copper salt of an organic chelating agent in an amount sufficient to supply a phytotoxically effective quantity of copper ions in the treatment of a drain system; said organic chelating agent being effective to solubilize copper and heavy metals in the presence of an alkali at a pH of about 13 to 13.5, and

said chelating agent being present in an amount in excess of the amount required to solubilize a phytotoxically effective quantity of copper ions sufficient to inhibit root growth within a treated drain system with the excess chelating agent functioning to solubilize heavy metals within the drain system,

whereby root growth within a treated drain system is inhibited by the solubilized copper ions while the formation of scale and heavy metal soaps within a treated drain system is inhibited by the excess of the chelating agent through solubilization of the heavy metals in the system.

3,905,910

METHOD FOR MAKING FILTER AIDS DISPERSIBLE IN HYDROCARBON LIQUIDS AND THE DISPERSIBLE PRODUCTS

Garth Coombs, Evergreen; Elbert Roy Butterworth, Littleton, and George Richard Bell, Larkspur, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 11, 1974, Ser. No. 450,127

Int. Cl. C09k *3/00*

U.S. Cl. 252—259.5 **14 Claims**

1. A method of making a dispersable filter aid material having a desired surfactant concentration, having essentially the same flow characteristics as untreated filter aid material and that rapidly disperses in hydrocarbon liquids, consisting essentially of:

a. intensively mixing a desired amount of filter aid with an amount of a surfactant to form a free-flowing first concentrated mixture, the surfactant concentration in said first mixture being at least ten times as great as the surfactant concentration in the dispersable filter aid material;

b. adding, in at least one step, sufficient filter aid to a desired amount of the first concentrated mixture to produce the desired surfactant concentration in the dispersable filter aid material and gently blending the filter aid and the desired amount of first concentrated mixture after the addition of filter aid until an intimate mixture of surfac-

tant and filter aid is obtained to produce the dispersable filter aid material.

3,905,911

COPPER ACTIVATED HAFNIUM PHOSPHATE PHOSPHORS AND METHOD OF MAKING

Paul V. Kelsey, Jr., Blackburg, Va., and James E. Mathers, Ulster, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 25, 1974, Ser. No. 509,285
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 P **4 Claims**

1. A luminescent composition of matter having a matrix of $Hf_3CPO_4)_4$ activated by copper corresponding to the formula $Hf_3(PO_4)_4$:Cu wherein the amount of copper is from about 0.005 to 25% by weight of said matrix, said composition luminescing green under ultraviolet, cathode ray or x-ray excitation.

3,905,912

RARE EARTH ACTIVATED HAFNIUM PHOSPHATE LUMINESCENT MATERIALS

James E. Mathers, Ulster, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 25, 1974, Ser. No. 509,289
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 P **5 Claims**

1. A phosphor material having the general formula $Hf_3(PO_4)_4$: RE wherein RE is selected from the group consisting of: terbium, praseodymium; dysprosium; thulium; and europium and is present in an amount of from about 0.05 to 0.1 mole per mole of $Hf_3(PO_4)_4$.

3,905,913

CATALYST SYSTEM FOR THE HOMO- AND CO-POLYMERIZATION OF OLEFINS, CONJUGATED OR UNCONJUGATED DIENES

Margherita Corbellini, Milan, and Agostino Balducci, San Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Sept. 10, 1973, Ser. No. 395,592
Claims priority, application Italy, Mar. 11, 1970, 21750/70
Int. Cl.² B01J *27/10, 31/14*
U.S. Cl. 252—429 A **6 Claims**

1. A catalyst system useful for the homo- and co-polymerization of olefins, conjugated and unconjugated dienes or mixtures of said unsaturated compounds consisting essentially of a transition metal compound selected from the group consisting of $TiCl_3$ and $TiCl_4$ and an aluminum compound having the general formula:

$$X_2Al—\underset{\displaystyle R}{\underset{|}{N}}—R'—\underset{\displaystyle R}{\underset{|}{N}}—Al\,X_2$$

in which X is hydrogen or halogen; both R's are hydrocarbon radicals; and R' is an unsaturated or saturated aliphatic divalent hydrocarbon radical, unsubstituted cycloalkylene radical, or unsubstituted arylene raidcal.

3,905,914

V-P-ZR CATALYSTS AND METHOD OF PREPARATION THEREOF

Anthony T. Jurewicz, 9 Bedford Rd.; Lewis Brewster Young, 59 Stockton Rd., both of Kendall Park, N.J. 08824, and Chin-Chiun Chu, 112 Wells Dr., South Plainfield, N.J. 07080

Filed July 16, 1973, Ser. No. 379,538
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 **8 Claims**

1. A method for preparing a vanadium-phosphoruszirconium composite, having an atomic ratio of P/V of between about 0.5 and about 2 and an atomic ratio of Zr/V of between about 0.0025 and about 0.5, which comprises:

a. forming a mixture of (i) a vanadium compound selected from the group consisting of V_2O_5, $VOCl_3$, $VO(NO_2)_3$, NH_4VO_3 and $VF5_3$, (ii) a zirconium salt selected from the group consisting of $ZrOCl_2$, $ZrOCl_2{\cdot}4H_2O$, $ZrOCl_2{\cdot}8H_2O$, $ZrO(OAc)_2{\cdot}H_2O$, $ZrCl_4$, $Zr(OAc)_4$, Na_2ZrCL_6 and $ZrOBr_2{\cdot}XH_2O$, and (iii) aqueous HCl. HBr or HI;

b. heating the resulting solution at a temperature between about 50°C. and about 125°C. for a sufficient time to convert the resulting orange slurry to a blue solution, the quantity of the hydrogen halide (iii) being at least about 5 moles per gram atom of said vanadium compound (i) and the amount of said zirconium salt (ii) being from about 0.0025 to about 0.5 gram atom per gram atom of vanadium compound (i);

c. adding from about 0.5 to about 2 gram atoms of phosphoric acid or of a compound hydrolyzable to phosphoric acid per gram atom of said vanadium compound, to the resulting solution to form a gel; and

d. drying the gel.

3,905,915

MULTIPLE-STEP PROCEDURE FOR PRODUCING A POLYMERIZATION CATALYST

Harry J. Wristers, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 162,701, July 14, 1971, abandoned. This application June 21, 1973, Ser. No. 372,110
Int. Cl. B01j *31/02*
U.S. Cl. 252—429 A **18 Claims**

1. A process for producing a $TiCl_3n\ AlCl_3$, wherein n is a number either from about 0.15 to 0.50 or from about 0.3 to 1.0, olefin polymerization, catalyst product in round, compact, particulate form having a mean particle diamether within the range of about 10 to 200 microns, which comprises the steps of:

a. forming a mixture of finely-divided preformed solid "seed" catalyst having essentially the same chemical composition as said desired catalyst product, but more finely-divided than said product, with $TiCl_4$ and a reducing agent selected from the group consisting of:

R_2Mg, RMgX, NaR, or an MR,

wherein:

R is a C to C_8 alkyl or substituted alkyl radical;

Mg is Magnesium;

X is Cl, Br or I;

M is a metal from Groups IA, IIA, IIB or IIIA of the Periodical Table,

at a temperature sufficiently low so that the reducing rate for said $TiCl_4$ is negligible, in a suitable inert diluent, in which both $TiCl_4$ and said reducing agent are soluble, but in which said seed catalyst is insoluble,

b. heating said mixture at a controlled slow rate of 0.2° C/Min to 2.0° C/Min while mixing until a temperature of +25° C is reached.

ALH/ RJB

3,905,916
PROCESS FOR PREPARING A HYDROTREATING CATALYST

Kenneth L. Riley, Baton Rouge, La.; William T. House, Baytown, Tex., and John E. Hofmann, Berkeley Heights, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 162,662, July 14, 1971, abandoned. This application Apr. 26, 1973, Ser. No. 354,661

Int. Cl. B01j *11/40*

U.S. Cl. 252—453 **12 Claims**

1. Process for preparing an improved hydrotreating catalyst comprising:

a. precipitating the oxides or hydrated oxides of aluminum and silicon from an aqueous solution of water soluble salts thereof at a temperature ranging from about 105° to 120°F., at a range of pH between about 5 and 9.5, and at an alumina concentration, expressed as Al_2O_3, between about 1.2 to 5.0 weight percent;

b. washing the precipitate from step (a) to remove impurities therefrom;

c. impregnating the washed precipitate with Group VIII and Group VI B metals;

d. drying the impregnated catalyst from step (c);

e. adding sufficient water to said dried, impregnated catalyst to provide an extrudable slurry;

f. extruding said slurry to form an extrudate; and,

g. drying and calcining said extrudate whereby an improved hydrotreating catalyst is obtained comprising an oxide of a Group VIII metal and an oxide of a Group VI B metal deposited upon a support material consisting essentially of 1 to 20 weight percent silica and the balance alumina, said catalyst being characterized by exhibiting a surface area of at least about 190 m^2/gm measured in micropores having a diameter of 30–80A and a pore volume less than about 0.10 ml/gm. as macropores having diameters greater than about 100 A.

3,905,917
CATALYST FOR PURIFYING EXHAUST GAS

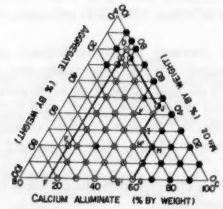
Atsushi Nishino; Kazunori Sonetaka, both of Neyagawa; Hiroshi Kumano, Daito, and Yoshinori Noguchi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed July 20, 1973, Ser. No. 381,232

Claims priority, application Japan, June 15, 1973, 48-68043; June 15, 1973, 48-68049

Int. Cl.² B01J *29/06, 23/08*

U.S. Cl. 252—455 R **8 Claims**



1. A catalyst for purification of exhaust gas, which consists essentially of manganese oxide as a main catalytic component, heat-resistant aggregates and calcium aluminate as a binder, proportions of the manganese oxide in terms of manganese dioxide, the aggregates and the calcium aluminate being within a composition range surrounded by lines plotted between points D, E, H, I and J of ternary catalyst composition diagram of FIG. 1.

3,905,918
CATALYST FOR PURIFYING EXHAUST GASES

Gerhard Mai, Bruchkobel, and Reiner Siepmann, Rodenbach, both of Germany, assignors to W. C. Heraeus GmbH, Hanau am Main, Germany

Continuation-in-part of Ser. No. 330,137, Feb. 6, 1973, abandoned. This application Mar. 28, 1974, Ser. No. 455,766

Claims priority, application Germany, Sept. 16, 1972, 2245607; Japan, June 18, 1973, 48-67880

Int. Cl.² B01J *23/10*

U.S. Cl. 252—462 **11 Claims**

1. Catalyst for purifying exhaust gases containing nitrogen oxides, carbon monoxide or hydrocarbons, said catalyst comprising a support containing:

a. a composition having the formula

$$(A_1)_m(A_2)_n(B_1)_p(B_2)_qO_3$$

wherein

m and n, respectively, have values of 0 to 1, and p and q, respectively have values greater than 0 but less than 1, and

$m + n + 1$ and $p + q + 1$; and

A_1 is at least one trivalent cation of metals selected from the the group consisting of the rare earth metals;

A_2 is at least one divalent cation of metals selected from the group consisting of Sr, Ba and Pb;

B_1 is at least one divalent cation of metals selected from the group consisting of Ni, Co, Fe, Cu and Mn;

B_2 is at least one tetravalent cation of metals selected from the group of Ru, Os, Ir, Pt, Ti, Mo, Nb, Mn and V; with the proviso that when B_1 is Cu, n is 0 and B_2 is only Mn, when n is greater than 0, B_1 is selected from the group consisting of Ni, Co, Fe and Mn and B_2 is selected from the group consisting of Mn, Nb and V, with the further proviso that $(m \cdot a_1) + (n \cdot a_2) + (p \cdot b_1) + (q \cdot b_2)$ equals 6 such that a neutrality of charge exists, wherein a_1 equals the valency of A_1, a_2 equals the valency of A_2, b_1 equals the valency of B_1 and b_2 equals the valency of B_2; and

b. at least one element in metallic form selected from the group consisting of ruthenium, rhodium, palladium, iridium and platinum.

3,905,919
CYCLIC ACETAL PERFUME COMPOSITION

Robert F. Tavares, Cedar Grove, N.J.; Jack Agran, Brooklyn, N.Y.; William M. Easter, Hasbrouck Heights, and Leslie Blau, Dumont, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 342,122, March 16, 1973, Pat. No. 3,822,291. This application May 15, 1974, Ser. No. 470,246

Int. Cl. C11b *9/00*

U.S. Cl. 252—522 **3 Claims**

1. A method for improving the odor of fragrance compositions which comprises adding thereto a preparation of 4,7-dihydro 2-(3-pentyl)-1,3-dioxepin.

3,905,920
OZONE GENERATING DEVICE

Jacqueline N. Botcharoff, 97 rue des Moines, 75017 Paris, France

Filed Mar. 29, 1974, Ser. No. 456,263

Claims priority, application France, Apr. 6, 1973, 73.12427

Int. Cl. C01b *13/12;* **H02m** *7/00*

U.S. Cl. 250—536 **13 Claims**

1. An ozone generating device comprising, in combination:

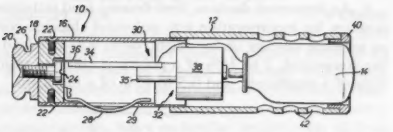
support means for providing d.c. voltage connections;

a generally hollow cylindrical casing having one end forming a base having connecting means for axial cooperation with said support means electrically to connect with said d.c. voltage connections;

converter means disposed within said casing adjacent said base for converting said d.c. voltage to a.c.; and

an ozone generating tube disposed along the axis of said casing and spaced from said converter means;

said converter means comprising transformer means for supplying high a.c. voltage pulses to said tube, oscillator means for energizing said transformer means at a first



frequency and at a fractional duty cycle whereby said transformer means is energized only intermittently, and capacitor means connected in series with a winding portion of said transformer means for providing a resonant frequency of said high a.c. voltage which is several times greater than said first frequency.

3,905,921
RAPIDLY-FOAMABLE, FAST-SETTING PHENOLIC RESIN PLYWOOD GLUE

Charles N. Cone, Portland, and Julius M. Steinberg, Hillsboro, both of Oreg., assignors to Pacific Adhesives Company, Inc., Hillsboro, Oreg.

Filed Mar. 26, 1973, Ser. No. 345,208
Int. Cl.² C08J *9/30;* **C08L** *61/06*
U.S. Cl. 260—2.5 F **17 Claims**

1. A rapidly foamable, fast setting phenolic resin liquid plywood glue comprising:

a. an aqueous alkaline solution of a resinous condensation product of a phenol and an aldehyde having a resin solids content of from 30–45% by weight, the resinous condensation product having a degree of advancement such as to impart to the aqueous resin solution a viscosity of from 3–30 poises,

b. dried animal blood having a water solubility not exceeding 90% by weight used in amount sufficient to render the liquid glue convertible upon agitation in a gas and in less than 30 seconds, to a foam having a density of less than 0.5 grams/cc,

c. from 0.1 to 10% by weight, based on the dried weight of the blood, of an aldehyde glue viscosity lowering agent, and

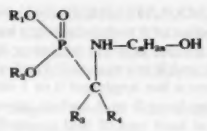
d. water used in amount sufficient to impart to the liquid glue a viscosity of from 1-50 poises.

3,905,922
FLAME RETARDANT URETHANE FORMS CONTAINING ALKANOL AMINO PHOSPHONATES

Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 386,520, Aug. 8, 1973, Pat. No. 3,855,363. This application Oct. 7, 1974, Ser. No. 512,438
Int. Cl.² C08G *18/32, 18/14*
U.S. Cl. 260—2.5 AJ **1 Claim**

1. A fire retardant polyurethane which comprises the product of reaction of a polyol and a polyisocyanate under foam producing conditions characterized in that at least part of said polyol comprises a compound having the formula:



wherein R_1 and R_2 are each selected from the class consisting of hydrocarbyl from 1 to 12 carbon atoms, inclusive, and halo-substituted hydrocarbyl from 1 to 12 carbon atoms, inclusive;

C_nH_{2n} represents alkylene from 2 to 8 carbon atoms, inclusive, having at least 2 carbon atoms separating the valencies; and

R_3 and R_4, taken together with the carbon atom to which they are attached, represent the residue of a cyclic member selected from the class consisting of cycloalkane, a cycloalkene and a cycloalkanone each of said cycloalkane, cycloalkene and cycloalkanone having from 4 to 8 ring carbon atoms, inclusive, and having from 0 to 4 lower-alkyl substituents.

3,905,923
POLY (UREA-URETHANE) FOAMS CONTAINING IMMOBILIZED ACTIVE ENZYMES

James H. Klug, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 4, 1974, Ser. No. 457,834
Int. Cl.² C08G *18/48*
U.S. Cl. 260—2.5 AD **6 Claims**

1. An enzyme-containing foam comprising: about 0.1 to 15 percent by weight of an active enzyme preparation on an anhydrous solids basis, and a hydrophilic poly(urea-urethane) foam matrix having an oxyalkylene backbone containing at least 50 mole percent oxyethylene; said hydrophilic foam being formed by reacting an isocyanate-terminated prepolymer containing an aqueous solution of said enzyme with water, and said hydrophilic foam entrapping and supporting said enzyme in an active configuration for enzymatic activity.

3,905,924
PROCESS FOR PREPARATION OF HIGH RESILIENCE POLYETHER URETHANE FOAM

Bela Prokai, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 325,327, Jan. 22, 1973, abandoned. This application June 3, 1974, Ser. No. 475,967
Int. Cl.² C08G *18/14, 18/48*
U.S. Cl. 260–2.5 AH **28 Claims**

1. A process for producing high resilience polyether urethane foam, said process comprising foaming and reacting a mixture comprising:

I. organic polyol selected from the group consisting of (A) a polyether triol containing at least 40 mole per cent primary hydroxyl groups and having a molecular weight from about 2,000 to about 8,000 and (B) a mixture of said polyether triol and another polyether having an average of at least two hydroxyl groups, said polyether triol of said mixture amounting to at least 40 weight per cent of the total polyol content;

II. organic polyisocyanate, said organic polyol and said polyisocyanate being present in the mixture in a major amount and in the relative amount required to produce the urethane;

III. blowing agent in a minor amount sufficient to foam the reaction mixture;

IV. a catalytic amount of catalyst for the production of the urethane; and

V. a cyanoalkyl modified siloxane fluid having the average formula

$(X)_zR_{3-z}SiO(R_2SiO)_x[(X)(R)SiO]_ySiR_{3-z}X_z$

wherein x has a value of 1 to 6 inclusive; y has a value of 0 to 6 inclusive; z has a value of 0 to 1 inclusive; R is a lower alkyl or phenyl radical; and X is a cyanoalkyl radical of the formula $-(O)_nR'CN$ where n has a value of 0 or 1 and R′ is an alkylene radical having from 2 to 4 carbon atoms; said siloxane fluid containing at least one of said cyanoalkyl radicals and having an average molecular weight in the range of about 400 to about 1,500 in an amount sufficient to stabilize the foam against voids and shrinkage.

3,905,925
PROCESS FOR PREPARING POLYURETHANE PRODUCTS

Christiaan Vervloet, Delft, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 25, 1974, Ser. No. 445,703
Claims priority, application United Kingdom, Feb. 14, 1974, 6858/74
Int. Cl. C08g *22/48, 22/16, 22/18*
U.S. Cl. 260—2.5 BD **16 Claims**

1. A process for preparing polyurethane products which comprises contacting a quasi-hydroxyl prepolymer with a molar excess of quasi-isocyanate prepolymer wherein the resulting mixture was terminal isocyanate groups and the isocyanate index of the resulting mixture is above 100 and less than 115, and wherein:

a. the quasi-isocyanate prepolymer is obtained by contacting
  i. a di-isocyanate having an average molecular weight of from 100 to 500, with
  ii. a high molecular weight diol having an average molecular weight of from 500 to 4500,

wherein the amount of di-isocyanate is from 3 to 12 moles per mole of high molecular weight diol; and

b. the quasi-hydroxyl prepolymer is obtained by contacting
  i. a true-isocyanate prepolymer which is prepared by contacting
    A. a di-isocyanate, having an average molecular weight of from 100 to 500, with
    B. a high molecular weight diol having an average molecular weight of from 500 to 4,500,

wherein the amount of di-isocyanate is from 1.8 to 2.2 moles per mole of high molecular weight diol, with
  ii. a low molecular weight diol, having an average molecular weight of from 60 to 250,

wherein the amount of low molecular weight diol is from 4 to 17 moles per mole of high molecular weight diol used to prepare the true-isocyanate prepolymer.

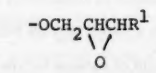
7. A process as claimed in claim 1 for the preparation of microcellular polyurethane, wherein water is included in the reaction mixture.

3,905,926
POLYMERIZABLE LIGNIN DERIVATIVES

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 44617

Filed Dec. 14, 1973, Ser. No. 424,879
Int. Cl.² C08L *97/00*
U.S. Cl. 260—17.5 **19 Claims**

1. An esterified lignin obtained by esterifying a carboxyl group in a carboxyl-containing lignin with an aliphatic monoalcohol of 1–16 carbon atoms and also containing per mole of lignin, at least one moiety of the formula



wherein R^1 represents hydrogen or a monovalent hydrocarbon radical containing one to 12 carbon atoms.

3,905,927
DUSTLESS FREE-FLOWING LEAD STABILIZER COMPOSITIONS FOR POLYVINYL CHLORIDE

Robert Frederick Anderson, Flemington, N.J., and Bojan Terzic, Lombard, Ill., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 21, 1973, Ser. No. 372,123
Int. Cl.² C08L *91/00;* **C08F** *19/14*
U.S. Cl. 260—23 XA **6 Claims**

1. An improved dustless, free-flowing lead stabilizing composition for incorporation into polyvinyl chloride comprising an intimate mixture of, by weight, 60 to 90% of a lead stabilizing compound, 5 to 35% of a polyvinyl chloride resin, 0.1 to 20% of a plasticizer, and 0.5 to 15% of a lubricant.

3,905,928
SURFACE-COATING COMPOSITIONS CONTAINING SUBSTITUTED OXAZOLIDINES

Henri Sidi, Paramus; and Hilding R. Johnson, Wayne, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

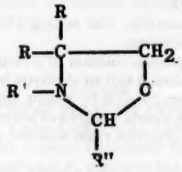
Filed Feb. 15, 1974, Ser. No. 443,044
Int. Cl.² C09D *5/14*
U.S. Cl. 260—29.6 MN **17 Claims**

1. A surface-coating composition having improved resistance to attack by bacteria and fungi that comprises

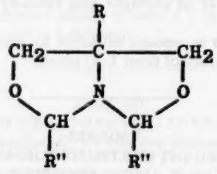
a. a water-insoluble, film-forming resinous binder selected from the group consisting of synthetic linear addition polymers prepared by the emulsion polymerization of ethylenically-unsaturated monomers, oleoresinous binders, and mixtures thereof, and

b. 0.10 percent to 3.0 percent, based on the weight of the composition, of a biocidal component selected from the group consisting of

  i. compounds having the structural formula



  ii. compounds having the structural formula



wherein each R represents alkyl of 1 to 6 carbon atoms, hydroxymethyl, or hydroxymethoxymethyl;
R' represents hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, halophenyl, or hydroxymethyl;
each R'' represents hydrogen, alkyl of 1 to 6 carbon atoms, chloroalkyl of 1 to 4 carbon atoms, phenyl halophenyl, hydroxymethyl, or $-(CH_2)_nCHO$; and
n represents 0 to 3; and

  iii. mixtures thereof.

3,905,929

AQUEOUS DISPERSIONS OF POLYURETHANE HAVING SIDE CHAIN POLYOXYETHYLENE UNITS

Klaus Noll, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

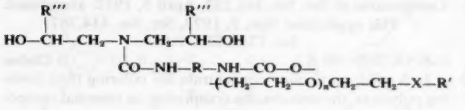
Filed Mar. 18, 1974, Ser. No. 452,163

Claims priority, application Germany, Mar. 23, 1973, 2314512

Int. Cl. C08g *22/14*, *51/24*

U.S. Cl. 260—29.2 TN 9 Claims

1. A process for making non-ionic aqueous polyurethane dispersions free from emulsifier which comprises reacting an organic diisocyanate and an organic compound which is difunctional for the purpose of an isocyanate polyaddition reaction, contains terminal hydrogen atoms which are reactive with isocyanate groups, has a molecular weight range of from about 500 to about 6,000 and is free from side chain polyethylene oxide units and with an organic compound which is difunctional for the purpose of the isocyanate polyaddition reaction, contains terminal hydrogen atoms which are reactive with isocyanate groups and contains side chain polyethylene oxide units, said organic compound containing side chain polyethylene oxide units having the formula



in which

R represents a divalent group obtained by removing the isocyanate groups from a diisocyanate with a molecular weight of from about 112 to about 1000,

X represents oxygen or —NR''—

R' and R'' are identical or different and represent monovalent hydrocabon groups containing 1 to 12 carbon atoms, R''' represents hydrogen or a monovalent hydrocarbon group containing 1 to 8 carbon atoms and

n represents an integer of from 4 to 89.

3,905,930

PAINT FUNGICIDE

Bruce Ivor Dittmar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 229,559, Feb. 29, 1972, which is a continuation-in-part of Ser. No. 841,987, July 15, 1969, abandoned. This application Dec. 17, 1973, Ser. No. 425,070

Int. Cl.[2] C09D *5/14*

U.S. Cl. 260—29.6 MN 4 Claims

1. A fungus-resistant paint composition comprising a dispersion of a film-former in a liquid vehicle containing 5 to 20,000 parts per million by weight, basis total paint composition, of a fungicidal compound selected from the group consisting of dimethyl 1,1'-(4-methyl-m-phenylenedicarbamoyl)bis(2-benzimidazolecarbamate);

dimethyl 1,1'-(p-phenylenedicarbamoyl)bis(2-benzimidazolecarbamate);

dimethyl 1,1'-[methylenedi-(p-phenylcarbamoyl)]bis(2-benzimidazolecarbamate); and

dimethyl 1,1'-[methylenedi-(4-cyclohexylcarbamoyl)]-bis(2-benzimidazolecarbamate).

2. The paint composition of claim 1 in which the dispersion of film-former is a latex.

3,905,931

WATER-BASED FILM LAMINATING ADHESIVE FROM POLY(ETHYL ACRYLATE), POLY(ETHYLENE/ACRYLIC ACID) AND 1,2-EPOXY RESIN

Richard Melvin Ziegert, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 305,543, Nov. 10, 1972, abandoned. This application May 9, 1974, Ser. No. 468,236

Int. Cl.[2] C08L *63/00*, *31/02*, *23/08*

U.S. Cl. 260—29.6 NR 9 Claims

1. A water-based adhesive composition which, on removal of water, cures to a water-resistant, thermally stable adhesive, consisting essentially of, on a solids weight basis, a suspension of between 15 and 40% solids content in an aqueous medium said solids content consisting essentially of between about 55 and about 80% of poly (ethyl acrylate), between about 4% and about 20% of a co-polymer of about 80 weight percent of ethylene and about 20 weight percent of acrylic acid, and between 8% and about 20% of a 1,2-epoxy resin.

3,905,932

PROCESS FOR PREPARING POLYCHLOROPRENE LATEX

Hideaki Nakazawa; Tetsuo Iikuni, and Mitsumasa Akashi, all of Shin-Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

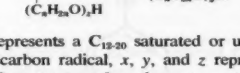
Filed Mar. 19, 1974, Ser. No. 452,608

Claims priority, application Japan, Mar. 29, 1973, 48-35975; Mar. 29, 1973, 48-35976

Int. Cl. C08d *1/09*, *3/14*; C07c *93/02*

U.S. Cl. 260—29.7 M 5 Claims

1. A process for preparing a polychloroprene latex which comprises polymerizing chloroprene in the presence of colloidal alumina sol in a quantity of 0.05–5 weight percent (as solid Al_2O_3) to monomer, and an emulsifier selected from inorganic or organic. Acid salt of N-alkylpropylenediamine-polyglycol ethers having the formula



wherein R represents a C_{12-20} saturated or unsaturated aliphatic hydrocarbon radical, *x*, *y*, and *z* represent 0 or an integer and $0 < x+y+z \leq 3$, and *n* represents the integer 2 or 3.

3,905,933

STABILIZATION OF RIGID POLYVINYL CHLORIDE RESIN COMPOSITION

Yoshio Itoh, Yokohama; Yoshitoshi Itsukaichi, Kawasaki, and Fumiaki Kuroi, Yokohama, all of Japan, assignors to Sankyo Organic Chemicals Co., Ltd., Kanagawa, Japan

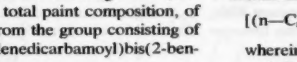
Filed Jan. 4, 1974, Ser. No. 430,677

Int. Cl.[2] C08G *6/00*

U.S. Cl. 260—31.6 16 Claims

1. A stabilized rigid polyvinyl chloride resin composition which comprises a polyvinyl chloride resin and a mixture selected from the group consisting of

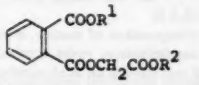
a. a mixture of di-n-octyltin maleate having the formula (I):



(I)

wherein *m* is 2–4,

and alkyl phthalyl alkyl glycolate having the formula (II):

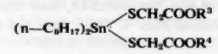


(II)

wherein R^1 R^2 are the same or different and each represents an alkyl radical having carbon atoms of 1–4,

in an amount of 0.5–1.5 times by weight that of the di-n-octyltin maleate and

b. a mixture of di-n-octyltin maleate having the formula (I), di-n-octyltin bis(alkylthioglycolate) having the formula (III):



(III)

wherein R^3 and R^4 are the same or different and each represents an alkyl radical having carbon atoms of 1–12.

in a smaller amount than the di-n-octyltin maleate, and alkyl phthalyl alkyl glycolate having the formula (II) in an amount of 025.–1.5 times by weight the sum of both the di-n-octyltin maleate and di-n-octyltin bis(alkylthioglycolate), in which composition the said mixture is incorporated in a ratio of 0.5–10.0 weight parts to 100 weight parts of a rigid polyvinyl chloride resin employed.

3,905,934

PHENOLIC RESIN-POLYISOCYANATE BINDER SYSTEMS CONTAINING DIALKYL PHTHALATE SOLVENTS

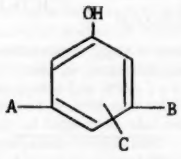
John J. Gardikes, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed May 23, 1974, Ser. No. 472,919

Int. Cl.² C08K *5/12*

U.S. Cl. 260—31.8 T **26 Claims**

1. A binder composition comprising in admixture a resin component, a hardener component, and a curing component, said resin component comprising a solution in an organic solvent comprising at least a liquid dialkyl phthalate of a non-aqueous phenolic resin which comprises a condensation product of a phenol having the general formula:



wherein A, B, and C are hydrogen, hydrocarbon radicals or halogen, with an aldehyde having the general formula R′CHO wherein R′ is a hydrogen or a hydrocarbon radical of 1 to 8 carbon atoms; said hardener component comprising liquid polyisocyanate containing at least two isocyanate groups.

3,905,935

DYE LAKING RESINS FOR PRINTING INKS

Philip G. Irwin, Huntington Twp., Westmoreland County; Thomas J. McNaughtan, Borough of Brentwood, Allegheny County, and Joseph G. Roberts, Borough of Pleasant Hills, Allegheny County, all of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jan. 15, 1973, Ser. No. 323,632

Int. Cl.² C08K *5/06*

U.S. Cl. 260—33.2 R **11 Claims**

1. As a new composition of matter, a phenol salicylic acid formaldehyde condensation resin formed by condensation with oxalic acid and having an acid number from about 65 to 125, a solution viscosity in diethylene glycol of about 50 to 250 stokes, and having a color not darker than about 4+.

3,905,936

COATING PARTICULATES

David Geoffrey Hawthorne, South Oakleigh, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Aug. 21, 1973, Ser. No. 390,222

Claims priority, application Australia, Aug. 25, 1972, 219/72

Int. Cl.² C08K *9/04*; **C09C** *3/08*

U.S. Cl. 260—40 R **17 Claims**

1. A method for the surface modification of particulate inorganic or mineral materials, which comprises treating the material with an organic aluminium derivative of the formula $(RO)_nAlR'_{3-n}$ where R is a radical selected from the group consisting of aliphatic or aromatic hydrocarbyl radicals containing 1–12 carbon atoms; R′ is a radical selected from the group consisting of acrylate and methacrylate radicals *n* has the value 1 or 2 and wherein said aluminium derivative is used as an amount of from 0.1 to 10 percent by weight of the material.

3,905,937

COLOR CONCENTRATES

R. T. Khanna, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 241,253, April 5, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,287

Int. Cl.² C08K *9/04*

U.S. Cl. 260—40 R **3 Claims**

1. A solid, particulate concentrate for coloring fiber-forming polymers, the concentrate comprising, as essential components,

A. colorant, 1–80 percent by weight;

B. 1–25 percent by weight of a deflocculating agent of Class I through Class X; and

C. a polymeric carrier not of Class I through Class X in (B), compatible with the fiber-forming polymer.

3,905,938

POLYESTER FILM BASE HAVING UNIFORM HIGH OPTICAL DENSITY

Kenneth T. Barkey; Gerald C. Gandy, and Douglas C. May, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 213,808, Dec. 29, 1971, Pat. No. 3,790,653. This application Aug. 27, 1973, Ser. No. 392,149

Int. Cl.² C08K *3/04*, *5/05*; **C08L** *67/02*

U.S. Cl. 260—40 R **10 Claims**

1. An opacifier for a polyester comprising a fluid dispersion consisting essentially of from about 15 to 20 parts of carbon black having an ultimate particle size of from about 5 to about 1,000 millimicrons, from about 4 to 5 parts of polyvinylpyrrolidone, said polyvinylpyrrolidone having a molecular weight in the range from about 1,000 to 100,000 and from about 76 to 80 parts of glycol, said glycol being chemically compatible with said polyvinylpyrrolidone, all parts being by weight.

5. In a process for preparing an opaque form of polyester, the steps of said process comprising (1) incorporating an opacifying amount of carbon particles into polyester forming reactants comprising glycol, dialkyl terephthalate and catalysts to form a mixture for forming a polyester monomer by an ester exchange reaction; (2) charging said mixture to an ester exchange reactor and heating and reacting said mixture to form said monomer; (3) condensing said monomer and polymerizing the condensed product to an opaque form of polyester, the improvement which comprises incorporating said carbon black particles into said mixture in the form of a fluid dispersion free of oversized carbon particles and consisting essentially of a homogeneous mixture of an opacifying amount of carbon black particles, glycol, and a carbon black dispersing amount of polyvinylpyrrolidone, said carbon particles having an ultimate particle size of from about 5 to 1,000 millimicrons, said dialkyl terephthalate being chemically com-

patible with said polyvinylpyrrolidone, and said polyvinylpyrrolidone having a molecular weight in the range of from about 1,000 to about 100,000 and being present in the dispersion in the ratio of at least one part by weight of polyvinylpyrrolidone per about 6 parts by weight of carbon black.

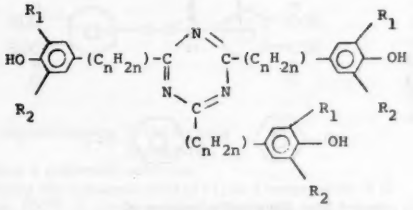
3,905,939

3,5-DIALKYL-4-HYDROXYPHENYL DERIVATIVES OF TRIAZINES

Martin Dexter, Briarcliff Manor, and Martin Knell, Ossining, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 135,461, April 19, 1971, Pat. No. 3,706,740. This application Oct. 10, 1972, Ser. No. 296,446
Int. Cl. B01j *1/16;* **C07d** *55/50*
U.S. Cl. 260—45.8 N **11 Claims**

1. A composition of matter stabilized against oxidative deterioration which comprises an organic material normally subject to oxidative deterioration containing from 0.005 to 5% by weight of a stabilizing compound of the formula



wherein

each of R_1 and R_2 is a (lower)alkyl group of from 1 to 6 carbon atoms; and

n has a value of 0, 1 or 2.

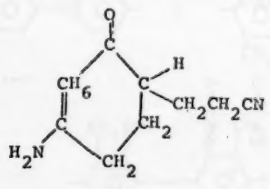
3,905,940

PROCESS FOR THE MANUFACTURE OF 5-AMINO-2-(β-YANOETHYL)-5-CYCLOHEXEN-1-ONE

Helmut Zondler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

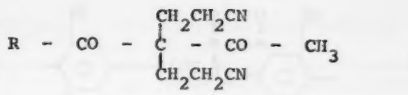
Filed Mar. 26, 1973, Ser. No. 345,153
Int. Cl. C07c *121/02, 121/48*
U.S. Cl. 260—464 **6 Claims**

1. Process for the manufacture of 5-amino-2-(β-cyanoethyl)-5-cyclohexen-1-one of the formula



(I)

characterised in that a bis-cyanoethylated diketone of the formula



(II)

in which R denotes phenyl, naphthyl, or alkyl of 1 to 10 carbon atoms, is cyclised by heating in the presence of a basic catalyst selected from the group consisting of an alkali metal alkanolate, alkali metal or sodium amide, and an organic solvent within which said diketone and basic catalyst is wholly or partially soluble and which is inert towards the constituents of the reaction mixture, to a temperature between about 40° and 250°C, whilst splitting off the molecular radical R—CO—.

3,905,941

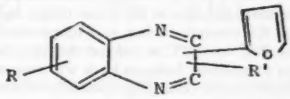
POLYQUINOXALINES AND METHOD OF PREPARATION

Robert J. Jones, Hermosa Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 31, 1973, Ser. No. 411,513
Int. Cl. C08f *5/04*
U.S. Cl. 260—47 UA **2 Claims**

1. A method for making polyquinoxaline polymers comprising:

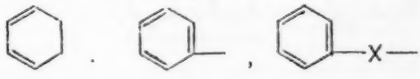
A. reacting at temperatures ranging from 25° to 300°C, equimolar amount of (i) a difuran end-capped monomer having the formula



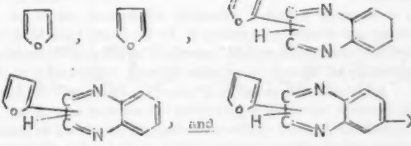
where

R′ is a monofunctional radical selected from the group consisting of hydrogen and furan;

when R′ is a furan radical, R is selected from the group consisting of

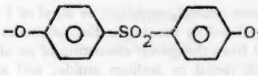


when R′ is a hydrogen radical, R is selected from the group consisting of



where X is selected from the group consisting of —O—, —C—, —CO—, —SO_2—, —CH_2—, —C_2H_4—,

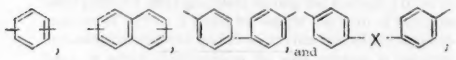
and



with (ii) an aromatic diolefin having the structure

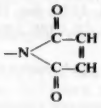
E—R''—E

where R'' is an aromatic difunctional radical selected from the group consisting of



where E is an olefinic radical selected from the group consisting of

and



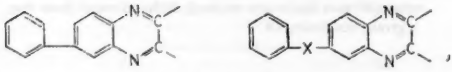
whereby a linear polyquinoxaline is formed having alicyclic endooxy linkages in the linear chain; and

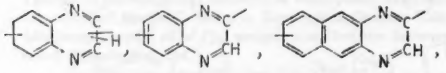
B. heating the polyquinoxaline in a temperature range of between 200° to 400°C to convert the alicyclic endooxy linkages to aromatic linkages by in situ aromatization.

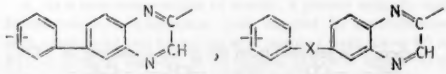
2. A polyquinoxaline consisting essentially of the structure:

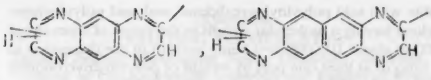
$-(E)-(R)-(E)-(R')-]_n$

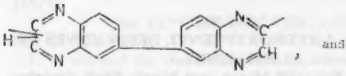
where R is a difunctional aromatic quinoxaline radical selected from the group consisting of



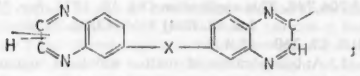






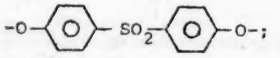


and

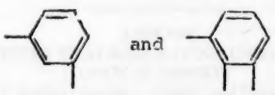


where X is selected from the group consisting of —O—, —S—, —CO—, $-SO_2-$, $-CH_2-$, $-C_2H_4-$, $-C_3H_6-$,

and

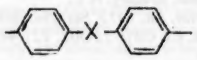


E is selected from the group consisting of



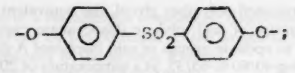
R' is a difunctional aromatic radical selected from the group consisting of

and



where X is selected from the group consisting of —O—, —S—, —CO—, $-SO_2-$,

$-CH_2-$, $-C_2H_4-$, $-C_3H_6-$, and



and n is an integer from 4 to 200.

3,905,942

METHOD FOR MAKING POLYETHERIMIDES AND PRODUCTS PRODUCED THEREBY

Tohru Takekoshi, Scotia, N.Y., and John E. Kochanowski, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

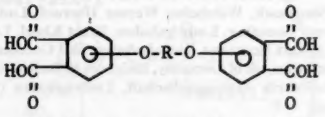
Continuation of Ser. No. 372,770, June 22, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,635

Int. Cl.[2] C08G *73/10*

U.S. Cl. 260—47 CP **13 Claims**

1. In the method for making polyetherimide in a stepwise manner involving the steps of

1. effecting reaction at ambient temperatures in the presence of an organic polar solvent between a tetra-acid of the formula

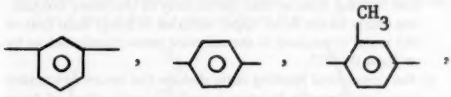


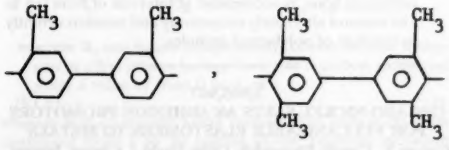
and an organic diamine of the formula

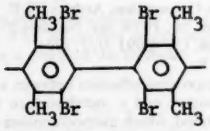
$$H_2NR^1NH_2$$

to produce a polyamide acid, and

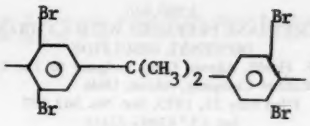
2. heating the polyamide acid of (1) to a temperature of at least 200°C to produce a polyetherimide, which comprises the improvement of reacting the tetra acid and the organic diamine of (1) in the presence of a non-polar or phenolic solvent at a temperature of at least 130°C, whereby the requirement of forming the polyamide acid in a polar organic solvent at ambient temperatures is avoided, where R is a member selected from the class consisting of (a) the following divalent organic radicals:



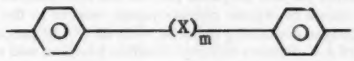




and

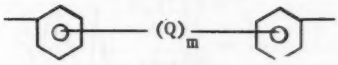


and (b) divalent organic radicals of the general formula



where X is a member selected from the class consisting of divalent radials of the formulas $-C_yH_{2y}-$,

—O— and —S— where m is 0 or 1, y is a whole number from 1 to 5, and R^1 is a divalent organo radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6-20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane cycloalkylene radicals having from 2–20 carbon atoms, and (c) divalent radicals included by the formula



where Q is a member selected from the class consisting of —O—,

—S—, $-C_xH_{2x}-$ and x is a whole number from 1 to 5 inclusive, and m is as previously defined.

3,905,943

PREPARATION OF FUMARATES

William T. Gormley, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 16, 1973, Ser. No. 351,188

Int. Cl. C08g *17/10*; **C07c** *69/60*

U.S. Cl. 260—75 UA **6 Claims**

1. An in situ process for preparing a dialkyl fumarate in a yield of at least about 90 wt. % comprising esterifying, under conditions which form a diester, maleic anhydride, maleic acid, or a monoester thereof with an alcohol in the presence of about 0.5 to about 10 mole % of fumaryl dichloride.

4. An in situ process for preparing a polyester wherein of the total of the fumarate/maleate content thereof, the fumarate comprises about 90 to 100% comprising esterifying, under conditions which form a polyester, maleic anhydride, maleic acid, fumaric acid or a monoester thereof with a polyol in the presence of about 0.5 to about 10 mole % of fumaryl dichloride.

3,905,944

POLYURETHANE PREPARED WITH 4,4'-DIAMINO DIPHENYL DISULFIDE

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 21, 1973, Ser. No. 362,587
Int. Cl.² C08G 22/16
U.S. Cl. 260—75 NH 1 Claim

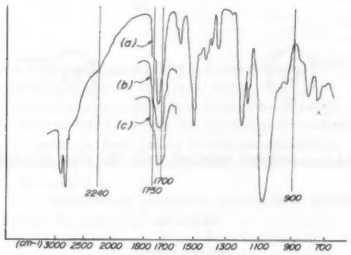
1. A homogeneous polyurethane having a crescent tear of at least 300 pounds per inch and prepared by reacting the excess NCO in a polyurethane reaction mixture consisting essentially of a reactive hydrogen containing material of at least 500 molecular weight selected from the group consisting of polyether polyols, polyester polyols and hydrocarbon polyols, an excess of organic polyisocyanate relative to the reactive hydrogen containing material, with 80 to 110 percent by weight of 4,4'-diamino diphenyl disulfide based on said excess NCO.

3,905,945

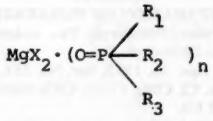
PREPARATION OF OXAZOLIDONE POLYMERS IN THE PRESENCE OF A MAGNESIUM HALIDE/PHOSPHINE OXIDE COMPLEX

Yutaka Iseda, Tachikawa; Motozumi Kitayama, Kodaira; Fumio Odaka, Kawagoe, and Shiro Anzai, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 9, 1973, Ser. No. 349,176
Claims priority, application Japan, Apr. 14, 1972, 47-36936
Int. Cl.² B01J 31/18; C08G 18/00, 18/16, 18/18
U.S. Cl. 260—77.5 R 11 Claims

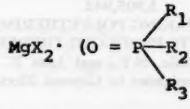


1. A process for preparing an oxazolidone polymer which comprises reacting a polyisocyanate with a polyepoxide, the equivalent ratio of isocyanate groups of said polyisocyanate to epoxide groups of said polyepoxide being 40/60 to 65/35 at a temperature of 20°C to 250°C in the presence of a magnesium halide/phosphine oxide complex having the following formula



in which X is a halogen atom, R_1, R_2 and R_3 are selected from the group consisting of an aliphatic and aromatic hydrocarbon and an amine which is disubstituted by an aliphatic hydrocarbon, containing from one to 20, inclusive, carbon atoms; *n* is 1, 2, 3 or 4, the amount of said magnesium halide/phosphine oxide complex being 0.05 to 10 mol percent of the amount of said polyepoxide and said polyisocyanate.

11. Polyoxazolidone polymers having a breakage strength of not less than 200 kg/cm² and an elongation at breakage of not less than 400% prepared by reacting (a) bisphenol A diglycidyl ether and (b) tolylene diisocyanate capped prepolymer of hydroxyl terminated polyether glycol, the equivalent ratio of isocyanate groups of said tolylene diisocyanate capped prepolymer (b) to epoxide groups of said bisphenol A diglycidyl ether (a) being 40/60 to 65/35, at a temperature of 20°–250°C in the presence of a magnesium halide/phosphine oxide complex having the following formula



in which X is a halogen atom, R_1, R_2 and R_3 are selected from the group consisting of an aliphatic and aromatic hydrocarbon and an amine which is disubstituted by an aliphatic hydrocarbon, containing from one to 20, inclusive, carbon atoms; *n* is 1, 2, 3 or 4, the amount of said magnesium halide/phosphine oxide complex being 0.05 to 10 mol percent of the amount of said polyepoxide and said polyisocyanate.

3,905,946

EXTRACTION OF POLYACTAMS

Werner Nieswandt, Weinheim; Werner Hoerauf, Ludwigshafen; Ernst Guenther, Ludwigshafen; Ernst Kissel, Ludwigshafen; Eckart Neumann, Ludwigshafen, and Guenter Valentin, Ruchheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1973, Ser. No. 392,244
Claims priority, application Germany, Aug. 30, 1972, 2242642
Int. Cl.² C08G 69/46
U.S. Cl. 260—78 L 10 Claims

1. A process for the extraction of monomer-containing and/or oligomer-containing polylactam granules which comprises continuously extracting polylactam granules with a countercurrent of water at temperatures above 80°C, under the following conditions:

a. the water flows upwardly through a substantially vertical extraction zone at a mean of from 0.5 to 20 cm/min and the polylactam granules pass downwardly through said extraction zone at a rate of from 0.2 to 5 cm/min,
b. the temperature at the upper end of the extraction zone is higher than at its lower end,
c. the extraction zone is divided into subzones by at least one heating zone so that the density of the water containing extractables in an upper subzone is lower than that of the water contained in the subzone immediately below by at least 0.0002,
d. the uppermost heating zone divides the entire extraction zone into lengths bearing a ratio to each other of from 50:50 to 85:15, the shorter section being at the upper end of the extraction zone, and
e. the water, which shows an overall ascent through the extraction zone, is accelerated at intervals of from 0.5 to 180 minutes alternately cocurrently and countercurrently to the flow of polylactam granules.

3,905,947

ORGANO-NICKEL SALTS AS ADHESION PROMOTORS FOR VULCANIZABLE ELASTOMERS TO METALS

George K. Cowell, Brunswick, Ohio; David J. Cherry, Somers, and William J. Considine, Pearl River, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

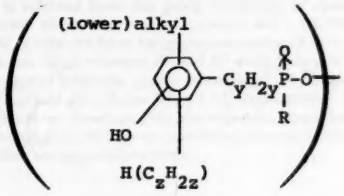
Filed Oct. 10, 1973, Ser. No. 404,971
Int. Cl.² C09J 3/12, 3/14
U.S. Cl. 260—79.5 R 8 Claims

1. A method of improving adhesion between a vulcanizable elastomeric composition and a metal surface to provide a strong and durable bond, which method consists essentially of

a. adding to a vulcanizable elastomeric composition from 0.05 phr to 10 phr by weight based on the weight of the elastomer of a compound of the generic formula

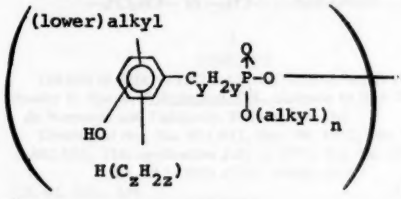
(Organic Ligand) Nickel(Anion) I

wherein the organic ligand is represented by one of the following generic formulas and the anion is represented by one of the following generic formulas or is an inorganic anion:



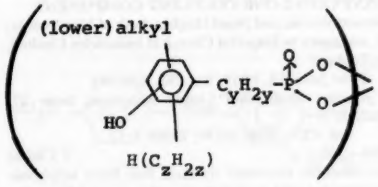
A

wherein R is an alkyl, cycloalkyl or aryl hydrocarbon group of 12 or less carbon atoms, *z* has a value of from 0 to 6, and *y* has a value from 1 to 4, or



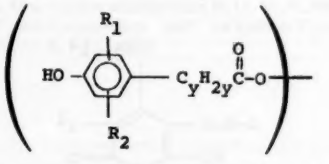
B

or



B'

wherein *z* has a value of from 0 to 6, *y* has a value of from 0 to 4 and *n* has a value of from 0 to 1, or



C

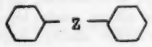
wherein R_1 and R_2 are independently of one another hydrogen or alkyl groups having from 1 to 6 carbon atoms and *y* has a value of from 0 to 4, or

$(RCO_2)^-$ D

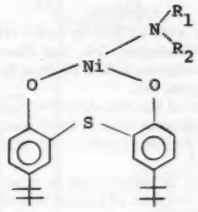
wherein R is an organic anion derived from carboxylic acids containing from 1 to 30 carbon atoms; phenoxy including alkylphenoxy; alkyl and arylsulfates and -sulfonates; or

$(RS(CH_2)_nCO_2)^-$ E

wherein R is alkyl, monoalkylaryl or polyalkyl aryl containing from 4 to 24 carbon atoms, alkyl with a thioether linkage or a group of the formula



wherein *Z* is oxygen, sulfur or the direct bond and *n* has a value of 1 or 2, or



F

wherein R_1 and R_2 independently of one another are hydrogen, alkyl, aryl, or the substituents N(R) (R) form part of a heterocyclic ring, and

b. vulcanizing the composition while it is in contact with the metal surface.

3,905,948

PROCESS FOR THE PREPARATION OF PETROLEUM RESINS

Silvio Vargiu, Sesto San Giovanni; Edoardo Carpaneti, Genova Bolzaneto; Beppino Passalenti, and Pietro Paparatto, both of Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A.

Filed Dec. 26, 1973, Ser. No. 428,577

Claims priority, application Italy, Dec. 22, 1972, 33444/72

Int. Cl.² C08F *15/04*

U.S. Cl. 260—82 **4 Claims**

1. A process for the preparation of petroleum resins from hydrocarbon fractions containing olefin and diolefins having a boiling range of from about 120° to 220°C which comprises

a. subjecting said hydrocarbon fraction to prepolymerization in the presence of 2–10 parts by weight activated clays/100 parts of the fraction itself at 25°–35°C for 20–40 minutes with transformation into high-boiling products in quantities equal to about 1–10 percent by weight with respect to the fraction itself;

b. separating the prepolymerization product from the activated clays to obtain a hydrocarbon solution of the polymer;

c. distilling said hydrocarbon solution to obtain a residual hydrocarbon fraction having a maximum boiling point of 210°–230°C;

d. subjecting the residual hydrocarbon fraction to polymerization in the presence of 0.1–1.0 parts by weight to 100 parts by weight of the fraction of Friedel-Crafts catalyst at 25°–70°C for 20–90 minutes with conversion into polymer of a quantity equal to or smaller than about 40 percent by weight with respect to the hydrocarbon fraction fed to the prepolymerization;

e. treating the product from step (d) with active earths in a quantity of 2–10 parts to 100 parts of said product for 1–60 minutes at 10°–60°C;

f. separating said product from the active earths and
g. distilling said product to remove low-boiling constituents therefrom and recovering petroleum resin from the polymerization product having a melting point at 125°–130°C.

3,905,949

STILBENE AZO LITHIUM SALT DYES

Melvin A. Perkins, Wilmington, Del., and Howard K. Urion, Woodstown, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 451,979, April 29, 1965, abandoned. This application Aug. 1, 1969, Ser. No. 846,981

Int. Cl.[2] C07C *105/00;* **C09D** *27/02;* **D21H** *3/80*

U.S. Cl. 260—143 **12 Claims**

1. Stilbene azo dye, as lithium salt or mixed lithium and sodium salts wherein the ratio of lithium to sodium is at least 1:2, prepared by condensing a member of the group consisting of the lithium salt of 5-nitro-o-toluenesulfonic acid and the dilithium, monolithium monosodium, and disodium salts of 4,4′-dinitro-2,2′-stilbenedisulfonic acid, in an aqueous alkaline reaction medium, at a temperature of from about 20°C. to the boiling temperature of the reaction medium, in the presence of sufficient ionic lithium to provide a ratio of lithium to sodium in the dye of at least 1:2, until formation of said stilbene azo dye is substantially complete.

3,905,950

REACTIVE DISAZO DYESTUFFS CONTAINING 1-AMINOALKYL-6-HYDROXYPYRID-6-ONE AND MONOCHLOROTRIAZINYL GROUPINGS

Allen Crabtree, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

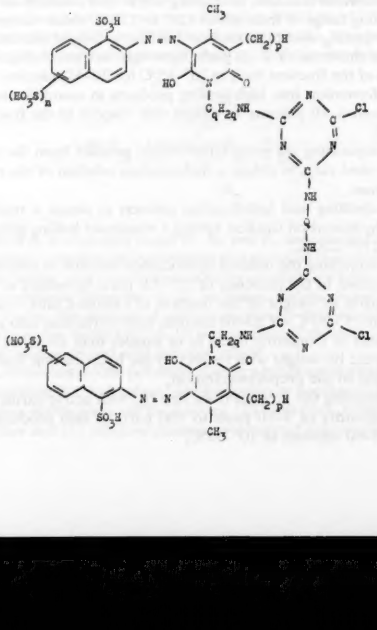
Continuation-in-part of Ser. No. 160,560, July 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 860,030, Sept. 22, 1968, abandoned. This application June 4, 1973, Ser. No. 366,686

Claims priority, application United Kingdom, Dec. 9, 1968, 58281/68

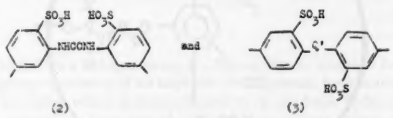
Int. Cl.[2] C09B *62/08;* **D06P** *1/38, 3/60*

U.S. Cl. 260—153 **6 Claims**

1. A disazo dyestuff of the formula:



wherein
n is 0, 1 or 2
p is 0, 1 or 2
q is 2 or 3 and
Q is a member of the group consisting of 4,6-disulpho-1,3-phenylene, 2,5-disulpho-1,4phenylene,



(2) and (3)

in which Q^1 is a direct link or —CH=CH—, —NH—CONH—, —S—, —OCH_2CH_2O—, —CH_2— or —CH_2CH_2—.

3,905,951

AZO DYESTUFFS CONTAINING A 1-LOWER ALKYL-6-YDROXYPYRID-2-ONE COUPLING COMPONENT

Alistair Howard Berrie, and Nigel Hughes, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

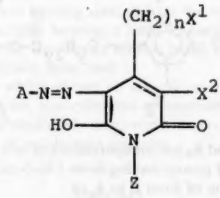
Filed June 23, 1969, Ser. No. 835,751

Claims priority, application United Kingdom, June 27, 1968, 30763/68

Int. Cl.[2] C09B *29/36;* **D06P** *3/52*

U.S. Cl. 260—156 **7 Claims**

1. Water-insoluble monoazo dyestuff free from sulphonic acid and carboxylic acid groups having the general formula,



wherein A is selected from the group consisting of phenyl, naphthyl and phenyl substituted with a member selected from the group consisting of chlorine, bromine, cyano, trifluoromethyl, nitro, lower alkyl, lower alkoxy, lower alkylsulphonyl, lower alkyl carbonyl, acetylamino, di(lower alkyl) amino, phthalyl, carbo lower alkoxy, carbo lower alkoxy lower alkoxy, carbo hydroxy lower alkoxy, sulphonamido, N-lower

alkyl sulphonamido, N:N-di(lower alkyl) sulphonamido, N-phenyl sulphonamido, carbonamido, N-lower alkyl carbonamido, N:N-di(lower alkyl) carbonamido, sulphomato, N-lower alkyl sulphamato and N:N-di(lower alkyl) sulphamato; *n* is an integer of 0–1; Z is selected from the group consisting of lower alkyl, hydroxy lower alkyl, lower alkoxy lower alkyl, benzyl, naphthyl, phenyl and phenyl substituted by a substituent selected from the group consisting of lower alkyl, chlorine, lower alkoxy and sulphonamido;

X^2 is selected from the group consisting of cyano, carbo lower alkoxy, lower alkyl carbonyl and —$CONR^1R^2$, and X^1 is selected from the group consisting of hydrogen and lower alkyl, wherein R^1 and R^2 each independently are selected from the group consisting of hydrogen, lower alkyl and phenyl and R^1 and R^2, together with the nitrogen atom to which they are attached, form the ring selected from the group consisting of morpholino, piperidino and pyrrolidino rings.

3,905,952

ORANGE PHENYLAZOAZOBENZENE ACID DYE

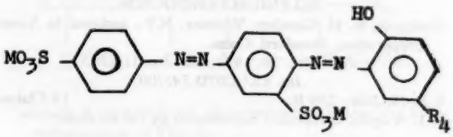
Stanley B. Speck, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 301,811, Oct. 30, 1972, Pat. No. 3,802,836. This application July 2, 1973, Ser. No. 375,944

Int. Cl.[2] C09B *31/06;* D06P *3/24*

U.S. Cl. 260—186 5 Claims

1. The orange dye of the structure



wherein M is a cation selected from H, Li, Na, K, NH_4, di(hydroxy-C_{2-3}alkyl)ammonium and tri(hydroxy-C_{2-3}alkyl)ammonium and R_4 is C_{1-8} alkyl.

3,905,953

POLY-5-HALOGENO-2'-HALOGENO-2'-DEOXYURIDYLIC ACIDS

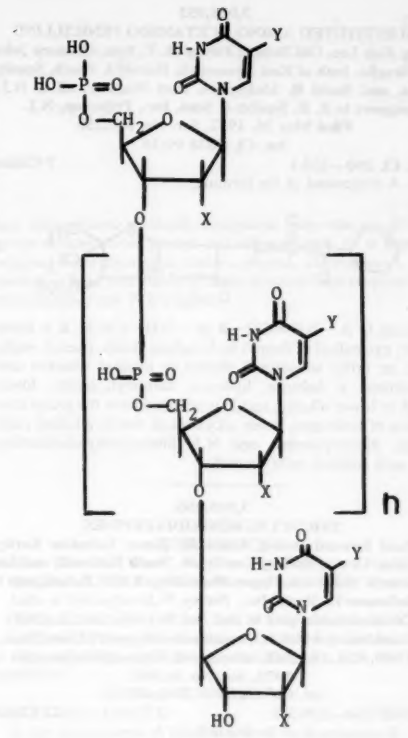
Michael Paul Kotick, Elkhart; Chimanbhai P. Patel, Mishawaka; Joseph L. Colbourn, Elkhart, and Robert J. Erickson, Elkhart, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 6, 1973, Ser. No. 422,403

Int. Cl.[2] C07H *19/10*

U.S. Cl. 260—211.5 R 13 Claims

1. A compound having the formula



wherein:

X is selected from the group consisting of fluoro, chloro, and bromo;

Y is selected from the group consisting of fluoro, chloro, bromo, and iodo; and

n is an integer having a value of from zero to infinity.

3,905,954

ACTIVATED CELLULOSE

David Thomas Jones, Ystalysera; Kenneth Rowland Rees, Dunvant, and George Edward Jowett, Uplands, all of Wales, assignors to Viscose Development Company Limited, Croydon, England

Filed July 21, 1972, Ser. No. 273,766

Claims priority, application United Kingdom, July 23, 1971, 34645/71

Int. Cl.[2] C08B *15/00;* C08L *1/24*

U.S. Cl. 260—212 11 Claims

1. A process for preparing an ion exchange activated cellulose in the form of porous bodies, caps, tubes, beads, granules or powders, which comprises reacting unregenerated cellulose with a compound having ionizable chemical groups which impart ion exchange properties to the cellulose reaction product, and thereafter regenerating the activated cellulose reaction product to yield an activated regenerated cellulose having ion exchange properties.

3,905,955

SUBSTITUTED AMINO ACETAMIDO PENICILLINS

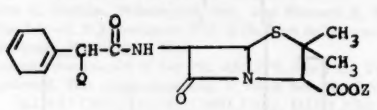
Bong Kuk Lee, Old Bridge; Dewey D. Y. Ryu; Gennaro John Miraglia, both of East Brunswick; Harold I. Basch, Somerset, and Barid B. Mukherjee, East Windsor, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 26, 1972, Ser. No. 257,256

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 7 Claims

1. A compound of the formula:



wherein Q is —NH═CH—R or —NH—CH_2R; R is lower alkyl; cycloalkyl of from 3 to 6 carbon atoms, phenyl, naphthyl, or ortho substituted phenyl or napthyl wherein said substituent is halogen, hydroxy, carboxyl, amido, lower alkyl or lower alkoxy; and Z is selected from the group consisting of hydrogen, lower alkyl, alkali metal, alkaline earth metal, dibenzylamine, and N,N-dibenzylethylenediamine; and acid addition salts thereof.

3,905,956

TRICYCLIC BENZODIAZEPINES

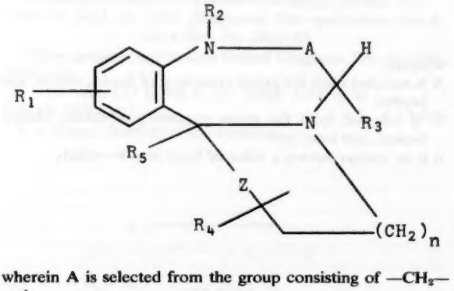
Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 6, 1970, Ser. No. 26,068

Int. Cl.[2] C07D *487/04*, *498/04*

U.S. Cl. 260—239.3 T 22 Claims

1. A compound of the formula



wherein A is selected from the group consisting of —CH_2— and

Z is a hetero atom selected from the group consisting of —O— and

where R_6 is hydrogen, lower alkyl or lower alkanoyl containing from 2–7 carbon atoms; n is an integer from 1 to 2; R_1 is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy; R_2 is hydrogen, lower alkyl, cycloalkyl-lower alkyl, hydroxy-lower alkyl, amino-lower alkyl, mono-lower alkylamino-lower alkyl, or di-lower alkylamino-lower alkyl; R_3 is hydrogen, lower alkyl or the group —COO— lower alkyl; R_4 is hydrogen, lower alkyl and —CH_2X where X is selected from the group consisting of chlorine, bromine, lower alkoxy, lower alkoxy-lower alkyl and di-lower alkyl-amino; and R_5 is hydrogen, lower alkyl, pyridyl, phenyl and phenyl substituted with a member selected from the group consisting of halogen, nitro, trifluoromethyl and lower alkyl.

12. The compound of claim 11 wherein R_1 is chlorine, R_2 and R_3 are hydrogen, R_4 is methyl and is joined to the 3-position of the heterocyclic ring, R_5 is phenyl, i.e., 10-chloro-2,3,5,11b-tetrahydro-3-methyl-11b-phenyloxazolo[3,2-d][1,4]-benzodiazepin-6-(7H)-one.

3,905,957

3-ARYL-5-OXO-2-PYRAZOLINE-4-CARBOXANILIDES AND PROCESS THEREFOR

Walter Sirrenberg, Ingelheim am Rhein; Rudolf Bauer, Wiesbaden; Werner Schulz, and Rolf Banholzer, both of Ingelheim am Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

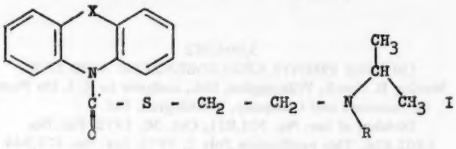
Filed Mar. 22, 1972, Ser. No. 236,987

Claims priority, application Germany, Mar. 27, 1971, 2114893

Int. Cl.[2] C07D *223/22*, *265/38*, *279/22*

U.S. Cl. 260—239 D 7 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein X is selected from the group consisting of ethylene and vinylene and R is alkyl of 1 to 4 carbon atoms, non-toxic, pharmaceutically acceptable acid addition salts and lower alkyl quaternary ammonium salts thereof.

3,905,958

SELENIUM COMPOUNDS

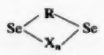
Wolfgang H. H. Gunther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1971, Ser. No. 210,275

Int. Cl.[2] C07D *345/00*

U.S. Cl. 260—239 R 15 Claims

1. A cyclic compound represented by the formula:



wherein R is selected from the group consisting of divalent hydrocarbylene and halohydrocarbylene radicals having from 5 to 50 carbon atoms and heterocyclic radicals having from 2 to 20 carbon atoms, n is 1 and X is the radical — Se — R — Se —.

3,905,959

PROCESS FOR THE MANUFACTURE OF CRYSTALLINE ANHYDROUS AMPICILLIN

Susumu Nakanishi, East Lyme Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 7, 1973, Ser. No. 357,581

Int. Cl.[2] C07D *499/04*

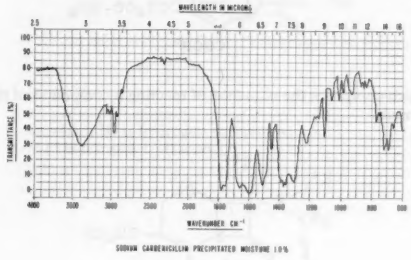
U.S. Cl. 260—239.1 3 Claims

1. A process for the manufacture of crystalline anhydrous ampicillin which comprises the steps of combining from about 1 to 20 percent of weight of amorphous ampicillin trihydrate with n-propyl alcohol or n-butyl alcohol; evaporating said alcohol from said mixture at from about −10° to 35°C. while adding fresh anhydrous n-propyl alcohol or n-butyl alcohol to maintain said concentration whereby said ampicillin is dehydrated by co-distillation; and separating and drying the resulting crystalline anhydrous ampicillin.

3,905,960
CRYSTALLINE ANHYDROUS PENICILLINS AND PREPARATION THEREOF

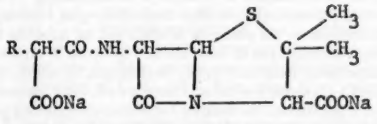
Dennis E. Clark, Basking Ridge, and William J. Kerr, Somerville, both of N.J., assignors to Beecham, Inc., Great Britain

Continuation-in-part of Ser. No. 82,951, Oct. 22, 1970, abandoned. This application Sept. 30, 1971, Ser. No. 185,266
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 13 Claims



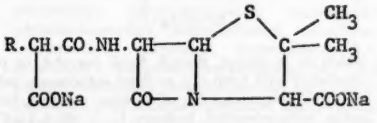
SODIUM CARBENICILLIN PRECIPITATED MOISTURE 1.0%

1. The crystalline anhydrous di-sodium penicillin salt of the formula:



wherein R is phenyl and characterized by having the infrared spectrum of FIG. 2.

12. The crystalline anhydrous di-sodium penicillin salt of the formula:



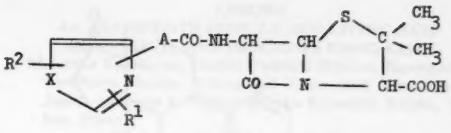
wherein R is thienyl and characterized by having the infrared spectrum of FIG. 2B.

3,905,961
THIAZOLE PENICILLINS

John Leheup Archibald, Windsor, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Continuation of Ser. No. 1,019, Jan. 6, 1970. This application Jan. 19, 1973, Ser. No. 324,915
Claims priority, application United Kingdom, Jan. 7, 1969, 924/69; Jan. 7, 1969, 925/69
Int. Cl.[2] C07D *499/46*
U.S. Cl. 260—239.1 10 Claims

1. A synthetic penicillin selected from those of the general formula



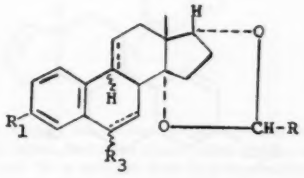
and their pharmaceutically acceptable salts wherein R^1 is a group selected from phenyl and chlorophenyl; R^2 is a group selected from hydrogen, amino, phenyl, chlorophenyl, and methyl; A is a lower alkylene chain selected from ethylene and trimethylene; and X is sulphur.

3,905,962
OESTRATRIENES

Arthur Friedrich Marx, Florence Nightingalelaan 12, Delft, and Rudolf De Lang, Burg. Zaneveldstraat 276, Maassluis, both of Netherlands

Continuation-in-part of Ser. No. 121,582, March 5, 1971, abandoned. This application Apr. 17, 1974, Ser. No. 461,806
Claims priority, application United Kingdom, Mar. 6, 1970, 10995/70
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 46 Claims

1. An oestratriene of the formula



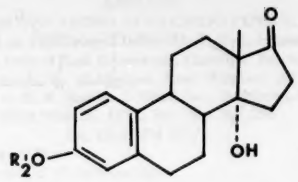
in which the dotted lines in the positions 6–7 and 9–11 indicate the optional presence of another bond, and wherein

R represents a hydrogen atom, an aliphatic hydrocarbon group having less than 10 carbon atoms, a cycloalkyl group having less than 7 carbon atoms, an aryl group having less than 11 carbon atoms and which may be substituted by a nitro group or by methoxy groups, an adamantyl group, a furyl group or a thienyl group,

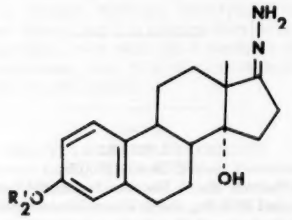
R_1 represents a hydrogen atom or an OR_2 group, wherein R_2 represents a hydrogen atom, an aliphatic hydrocarbon group having less than 4 carbon atoms, a β-dimethylaminoethyl group, an acyl residue derived from acetic or sulfuric acid or an alkali metal salt thereof or a 1H-tetrazolyl group, and

R_3 represents a hydrogen atom, a hydroxyl group, an acetoxy group or an oxo group.

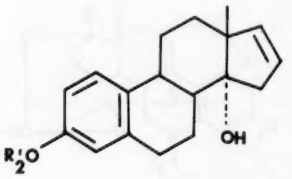
46. Process for the preparation of an oestratriene as defined in claim 1 which comprises converting 14α-hydroxy-oestrone with a compound selected from the group consisting of a halogenide of the formula R_2'-hal and a sulphate of the formula $(R_2')_2\,SO_4$, wherein R_2' is as defined in claim 45, to a corresponding 3-ether of the formula:



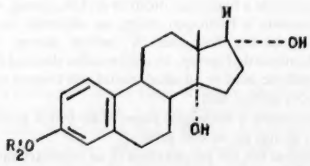
reacting a compound thus obtained with hydrazine to obtain a corresponding 17-hydrazone derivative of the formula:



oxidizing a 17-hydrazone compound thus obtained with iodine to a corresponding 17-iodo derivative, reducing this compound with sodium and an alkanol to a corresponding 16-dehydro derivative of the formula:



converting a 16-dehydro derivative thus obtained with a peracid to a corresponding 16α,17α-epoxy derivative, reducing this compound by means of $LiAlH_4$ to a 14α,17α-dihydroxyoestratriene of the formula:



and converting a compound thus obtained with an aldehyde of the formula RCHO, wherein R is as defined in claim 1.

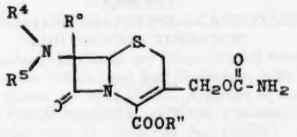
3,905,963

PROCESS FOR PREPARING PRIMARY 3-CARBAMOYLOXYMETHYL CEPHALOSPORINS

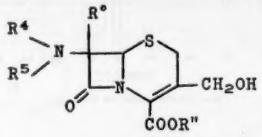
J. Alan Webber, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 25, 1972, Ser. No. 220,697
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C **7 Claims**

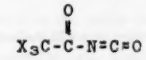
1. A process for preparing a compound having the formula



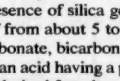
which comprises the sequence of reacting a compound of the formula



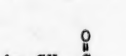
with an N-substituted isocyanate of the formula



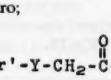
in which X is halogen, to produce a corresponding 3-(N-substituted) carbamoyloxymethyl derivative, and cleaving the N-substituent in the presence of silica gel, an aqueous buffer solution having a pH of from about 5 to about 9, an alkali or alkaline earth metal carbonate, bicarbonate, or sulfite, or zinc with a C_1–C_4 alcohol or an acid having a pK value greater than about 3 to produce the desired 3-carbamoyloxymethyl cephalosporin derivative, in which, in the foregoing formulae, R° is hydrogen or methoxy, R_4 is hydrogen and R_5 is C_1-C_8 alkanoyl; azidoacetyl;
cyanoacetyl;
haloacetyl;



in which Ar is phenyl, thienyl, furyl, pyrrolyl, or phenyl substituted with from one to three substituents selected from the group consisting of fluorine, chlorine, bromine iodine, trifluoromethyl, hydroxy, C_1–C_3 alkyl, C_1–C_3 alkoxy, cyano, and nitro;



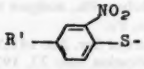
in which Ar' is phenyl, pyridyl, or substituted phenyl as defined above, and Y is oxygen or sulfur;



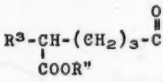
in which Ar is as defined above, and B is a hydroxyl or carboxyl group protected by esterification; —CN; —N_3; or —NHR in which R is benzyloxycarbonyl, C_1–C_4 alkoxycarbonyl, cycloalkoxycarbonyl, triphenylmethyl,

$CH_3\overset{|}{C}=CH-CO_2CH_3$,

or 2,2,2-trichloroethoxycarbonyl; (3-sydnone)C_2–C_3 alkanoyl;

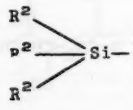


in which R′ is hydrogen or methoxy; 2-(1H-tetrazol-1-yl)acetyl;



in which R″ is as herein defined, and R^3 is amino or an acylamido group in which the acyl group is C_1–C_4 alkanoyl, C_6–C_{12} aroyl, C_1–C_4 alkoxycarbonyl, benzyloxycarbonyl, C_5–C_6 cycloalkoxycarbonyl, C_6–C_{12} aryloxycarbonyl, phthaloyl, or one of the above groups substituted with from one to three groups each selected from the group consisting of C_1–C_4 alkyl, halo, nitro, C_1–C_4 alkoxy, cyano; or

R^4 and R^5 taken together with the nitrogen to which they are bonded is phthalimido or a cyclic imide moiety of a C_3–C_{12} dicarboxylic acid, and R″ is hydrogen, an amine salt cation of dicyclohexylamine, triethylamine, or tributylamine, or a carboxy protecting group selected from the group consisting of C_1–C_6 alkyl, 2,2,2-trihaloethyl, 2-iodoethyl, C_5–C_7 tert-alkenyl, C_5–C_7 tert-alkynyl, benzyl, nitrobenzyl, tetrahydropyranyl, succinimidomethyl, phthalimidomethyl, methoxybenzyl, dimethoxybenzyl, cyanomethyl, nitrophenyl, dinitrophenyl, 2,4,5-trinitrophenyl, bis(p-methoxyphenyl)methyl, triphenylmethyl, benzhydryl, benzyloxymethyl, C_2–C_6 alkanoyloxymethyl, C_2–C_4 alkanoyl, phenacyl, and a radical of the formula



in which each R^2 independently is C_1–C_4 alkyl or halo selected from the group consisting of bromo, chloro, fluoro, and iodo, subject to the limitation that at least one R^2 is C_1–C_4 alkyl.

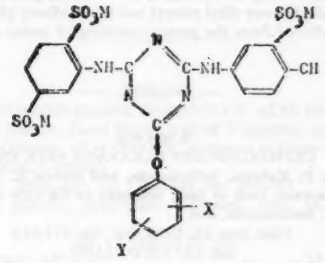
3,905,964

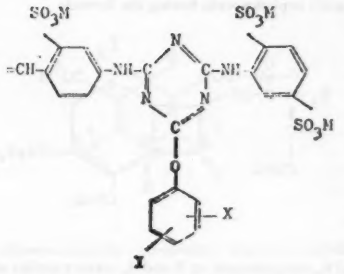
4,4′-DIAMINOSTILBENE-2,2′-DISULFONIC ACID DERIVATIVES AND PROCESSES USING SAME

Motohiko Yoshikawa, Omiya; Yoshiaki Shimizu, Kawaguchi; Yoshiharu Tanaka, Tokyo, and Kazuo Ishii, Yono, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1973, Ser. No. 323,431
Claims priority, application Japan, Aug. 4, 1972, 47-78139
Int. Cl.[2] C07D *251/14;* C09B *23/00*
U.S. Cl. 260—240 B 16 Claims

1. A bistriazinylaminostilbene derivative represented by the following formula:





wherein X and Y are the same or different and selected from chlorine atoms, hydrogen atoms, alkyl groups or methoxy groups and M is selected from hydrogen atoms, alkali or alkaline earth metals or ammonium cations or ammonium cations derived from a primary, secondary or tertiary amine.

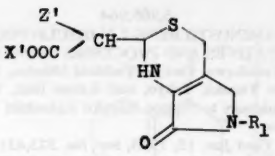
3,905,965

PROCESS OF TOTAL SYNTHESIS OF CEPHALOSPORIN DERIVATIVES AND INTERMEDIATES

Jacques Martel, Bondy, and Rene Heymes, Romainville, both of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 81,539, Oct. 16, 1970, Pat. No. 3,708,477, which is a continuation-in-part of Ser. No. 836,975, June 26, 1969, abandoned. This application Oct. 16, 1972, Ser. No. 297,776
Claims priority, application France, Oct. 17, 1969, 69.35596; Oct. 22, 1969, 69.36248
Int. Cl.[2] C07D *279/04*
U.S. Cl. 260—243 R 4 Claims

1. A 1,3-thiazine compound having the formula



wherein X′ is selected from the group consisting of hydrogen, lower alkyl and phenyl lower alkyl, R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl lower alkyl, lower alkyl phenyl and lower alkoxy phenyl, and Z′ is selected from the group consisting of amino and tritylamio.

3,905,966

CEPHALOSPORIN CLEAVAGE PROCESS

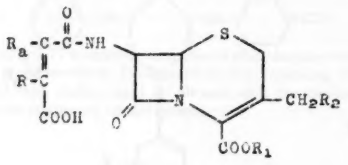
Stjepan P. Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed June 18, 1973, Ser. No. 371,011

Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C 12 Claims

1. A process for cleaving the amic acid function of a 7-(amic acid) cephalosporin having the formula



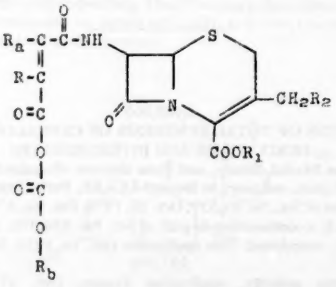
in which

R and R_a are hydrogen, or R and R_a taken together with the carbon atoms to which they are attached represent an orthophenylene ring;

R_1 is a carboxy protecting group; and

R_2 is hydrogen, acetoxy, methoxy, methylthio, (5-methyl-1,3,4-thiadiazol-2-yl)thio, or (1-methyl-1H-tetrazol-5-yl)thio; which comprises the steps of

1. reacting said 7-(amic acid) cephalosporin with an alkyl chloroformate in the presence of a tertiary amine to form the corresponding mixed anhydride having the formula



in which R_b is an alkyl group having from 1 to 4 carbon atoms;

2. reacting the product mixture from the aforementioned chloroformate treatment with a hydrazine of the formula

$R_3HNNHCH_3$

in which R_3 is hydrogen or methyl; and

3. recovering the corresponding 7-amino cephalosporin from the reaction mixture of the aforementioned hydrazine treatment.

3,905,967

METHOD FOR O-ACYLATING 7-ACYLAMINO-CEPHALOSPORADESIC ACIDS

David A. Berges, Audubon, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 141,380, May 7, 1971, abandoned. This application May 22, 1972, Ser. No. 255,632

Claims priority, application United Kingdom, Apr. 10, 1972, 16342/72

Int. Cl.² C07D *501/02*

U.S. Cl. 260—243 C 6 Claims

1. In a method for the preparation of O-acyl-7-acylaminocephalosporadesic acids, the improvement wherein the 3-hydroxymethyl group of a 7-acylaminocephalosporadesic acid is O-acylated by reacting at about 0° to 50°C. with an azolide the acyl group of which azolide may not contain an easily eliminated β-substituent.

3,905,968

PREPARATION OF 1,2-DICHLORO-3-AMINO PROPANE DERIVATIVES

Rupert Schneider, Rieben, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

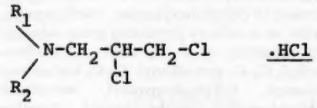
Filed Apr. 20, 1973, Ser. No. 352,955

Claims priority, application Switzerland, Apr. 28, 1972, 6441/72

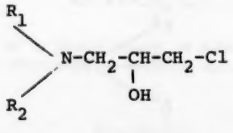
Int. Cl.² C07D *295/06*; C07C *87/127*, *17/16*

U.S. Cl. 260—247 4 Claims

1. The process for producing a 1,2-dichloro-3-amino-propane derivative in hydrochloride acid addition salt form and of the formula:



wherein each of R_1 and R_2 is independently alkyl of one to four carbon atoms or when taken together with the nitrogen atom to which they are bound form a five or six membered heterocyclic ring, which process comprises reacting a 1-chloro-2-hydroxy-3-amino-propane derivative of the formula:



wherein R_1 and R_2 are as defined above, with thionyl chloride at a temperature below 25°C. in an inert solvent for a time sufficient to obtain a precipitate of a first reaction product, and heating said precipitate in an inert solvent at a temperature sufficient to decompose said precipitate but below 85°C. to obtain said 1,2-dichloro-3-amino-propane derivative.

3,905,969

HETEROCYCLIC ESTERS OF 5H-[1]BENZOPYRANO[3,4-B]PYRIDINES

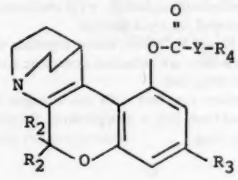
Louis Selig Harris, Richmond, Va.; Harry George Pars, Lexington, Mass.; Raj Kumar Razdan, Belmont, Mass., and Barbara Zitko Terris, Cambridge, Mass., assignors to Sharps Associates, Cambridge, Mass.

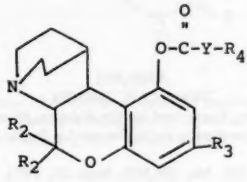
Filed Jan. 17, 1974, Ser. No. 434,089

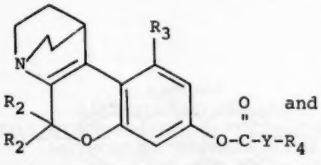
Int. Cl.[2] C07D *87/36*

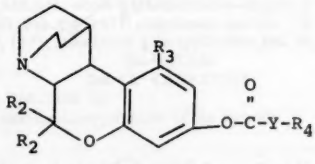
U.S. Cl. 260—247.2 B 7 Claims

1. A compound of the formulas

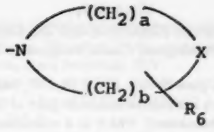








wherein R_2 is lower alkyl, R_3 is an alkyl having one to twenty carbon atoms, a cycloalkyl-lower alkyl or a phenyllower alkyl, Y is a straight or branched chain alkylene having one to eight carbon atoms, and R_4 is a group of the formula



wherein *a* is an integer from 1 to 4, *b* is an integer from 1 to 4 and X is CH_2, O, S or N—R_6 with R_6 being hydrogen or lower alkyl, and R_6 is hydrogen or a lower alkyl group bonded to a carbon in the ring; and the nontoxic pharmaceutically acceptable acid addition salts thereof.

3,905,970

1,4-DIHYDROPYRIDINE CARBOXYLIC ACID ESTERS

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

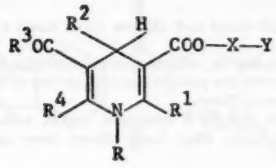
Filed Apr. 12, 1973, Ser. No. 350,381

Claims priority, application Germany, Apr. 18, 1972, 2218644

Int. Cl.[2] C07D *295/04*

U.S. Cl. 260—247.2 B 24 Claims

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, straight- or branched-chain lower alkyl, lower alkenyl or lower alkynyl;

R^1 and R^4 are the same or different and are each hydrogen or straight- or branched-chain lower alkyl;

X is straight- or branched-chain lower alkylene;

Y is α-, β- or γ-pyridyl, or the moiety NR′R″ wherein R′ and R″, together with the nitrogen atom to which they are attached, form a 5-, 6- or 7-membered heterocyclic ring wherein said nitrogen atom is the only heteroatom, or a 5-, 6- or 7-membered heterocyclic ring which has one additional heteroatom selected from the group consisting of oxygen, sulphur, NH or N-(lower alkyl); R^2 is phenyl unsubstituted or substituted by 1, 2 or 3 substituents selected from the group consisting of nitro, lower alkyl, lower alkoxy, phenyl, trifluoromethyl and halogen; benzyl, styryl; or naphthyl; and

R^3 is the moiety —OQ wherein Q is straight, branched or cyclic, saturated, partially unsaturated or unsaturated lower alkyl unsubstituted or substituted by one or two hydroxyl groups, alkoxyalkyl of up to 6 carbon atoms in both moieties or the moiety —O—X′—Y′ wherein

X′ is straight- or branched-chain lower alkylene and

Y′ is α-, β- or γ-pyridyl, or the moiety NR′R″ wherein R′ and R″ together with the nitrogen atom to which they are attached form a 5-, 6- or 7-membered heterocyclic ring wherein said nitrogen atom is the only heteroatom or a 5-, 6- or 7-membered heterocyclic ring which has at least one additional heteroatom selected from the group consisting of oxygen, sulphur, NH or N-(lower alkyl).

3,905,971

2-PHENYL-AS-TRIAZINE-3,5(2H,4H)DIONES

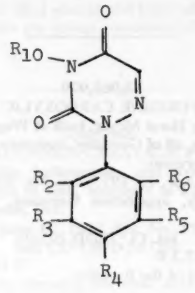
Max W. Miller, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 129,139, March 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 78,917, Oct. 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 768,191, Oct. 16, 1968, abandoned. This application May 29, 1973, Ser. No. 364,672

Int. Cl.[2] C07D *253/06, 265/30*

U.S. Cl. 260—247.5 C 27 Claims

1. A compound of the formula:

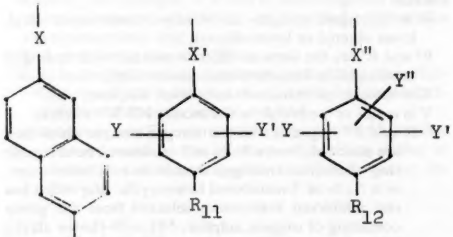


and the alkali metal and alkaline earth metal salts thereof wherein:

each of R_2 and R_6 is hydrogen, fluoro, chloro, cyano, or methyl; with the proviso that at least one of R_2 and R_6 is hydrogen or fluoro;

each of R_3 and R_5 is hydrogen, cyano, trifluoromethyl, halogen, lower alkyl, lower alkoxy, lower alkylthio, or nitro;

R_4 is



I II III

or $—CH_2—NR_{13}R_{14}$

wherein Z is hydrogen, lower alkylthio, or halogen;

Y, Y′ and Y″ are each hydrogen, halogen, lower alkyl, or trifluoromethyl;

X is oxygen, sulfur, or $—OCH_2—$;

X′ is $—OCH_2—$, $—SCH_2—$, $—SOCH_2—$, $—SO_2CH_2—$, or $—CH_2—$, $—OCH_2—CO—$,

$—NCH_2$;

X″ is oxygen, sulfur, SO, SO_2, >C=O, or —CHOH—;

R_{10} is hydrogen;

R_{11} is hydrogen, halogen, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, lower alkoxy, trifluoromethyl, or nitro;

R_{12} is lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, trifluoromethyl, lower alkanoyl or SO_2NRR_1' wherein

R is hydrogen, lower alkyl, allyl, propargyl, phenyl, benzyl, p-chlorophenyl, β-hydroxyethyl, β-acetoxyethyl, β-methoxyethyl, β-methylthioethyl, β-methylsulfonylethyl, or cyclopropyl;

R_1' is hydrogen, lower alkyl, allyl, propargyl, β-hydroxyethyl, β-acetoxyethyl, β-methoxyethyl, β-methylthioethyl, β-methylsulfonylethyl, γ-(β-methoxy-ethoxy)-propyl, cyclopropyl, or cyclopentyl;

and wherein R and R_1' when taken together with the nitrogen to which they are attached complete a morpholino or pyrrolidino ring; and

R_{13} and R_{14} taken together with the nitrogen to which they are attached complete a morpholino, thiomorpholino, or thiazolidino ring.

3,905,972

TRICYCLIC IMINES

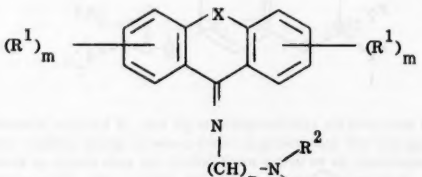
Philippe Dostert, Basel, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 184,901, Sept. 29, 1971, Pat. No. 3,803,234. This application Jan. 14, 1974, Ser. No. 433,318

Int. Cl.[2] C07D *295/00, 211/06*

U.S. Cl. 260—247.5 R 5 Claims

1. A compound of the formula



wherein X is ethylene or vinylene; R^1 is hydrogen, halogen, hydroxy, lower alkoxy, lower alkyl, cyano, lower alkoxycarbonyl, carbamoyl, or trifluoromethyl; R^2 and R^3, together with the nitrogen atom, are a monocyclic, saturated 5- or 6-membered heterocyclic group selected from the group consisting of pyrrolidino, piperidino, piperazino, morpholino, 4-methyl-piperazino and 4-hydroxypropyl-piperazino; R^4 is hydrogen or lower alkyl; *m* is an integer from 1 to 3; and *n* is an integer from 2 to 5,

or the pharmaceutically acceptable acid addition salts thereof.

3,905,973

THIOL METHYLATION WITH METHYL CHLORIDE

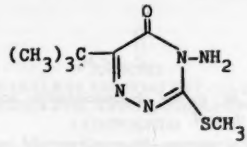
Richard John Gobeil, and Frank Runar Haglid, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 417,069, Nov. 19, 1973, abandoned. This application June 18, 1974, Ser. No. 480,409

Int. Cl.[2] C07D *253/06*

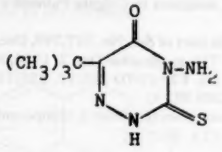
U.S. Cl. 260—248 AS 4 Claims

1. In the process of synthesizing the compound



(B)

by methylating the compound



(A)

in the presence of a base in an aqueous medium, the improvement which comprises using methyl chloride as methylating agent and conducting the methylation in the presence of iodide ion.

3,905,974

6-SUBSTITUTED OXO AND THIO-3-NITROIMIDAZO[1,2-b]-PYRIDAZINES AND METHODS OF PREPARING SAME

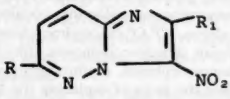
Andrew Stephen Tomcuecik, Old Tappan, N.J.; Patrick Thomas Izzo, and Paul Frank Fabio, both of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 293,234, Sept. 28, 1972, Pat. No. 3,828,041, which is a continuation-in-part of Ser. Nos. 118,508, Feb. 24, 1971, abandoned, and Ser. No. 118,510, Feb. 24, 1971, abandoned. This application Jan. 29, 1974, Ser. No. 437,546

Int. Cl.[2] C07D *237/26*

U.S. Cl. 260—250 AC 9 Claims

1. A nitroimidazopyridazine of the formula:



wherein R is hydroxy, C_1–C_8 alkoxy, methylthio, phthalimido C_1–C_4-alkoxy, phenyl C_1–C_4 alkoxy, C_1-C_4-dialkylamino-C_1-C_4-alkoxy, mono-C_1–C_4-alkoxy-C_1–C_4-alkoxy,monohydroxy-C_1–C_4-alkoxy, or allyloxy and R_1 is hydrogen or C_1–C_4 alkyl.

3,905,975

2-(5-NITRO-2-FURYL)-5-CHLOROPYRIMIDINE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,573

Int. Cl.[2] C07D *239/02*

U.S. Cl. 260—251 R 1 Claim

1. The compound 2-(5-nitro-2-furyl)-5-chloropyrimidine.

3,905,976

SUBSTITUTED TRICYCLIC QUINAZOLINONES

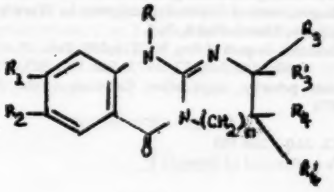
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 201,982, Nov. 24, 1971, abandoned. This application Jan. 19, 1973, Ser. No. 325,081The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.

Int. Cl.[2] C07D *487/14*

U.S. Cl. 260—256.4 F 34 Claims

1. A compound of the formula:



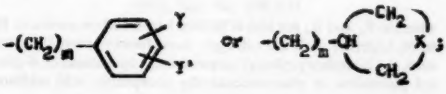
wherein

each of R_1 and R_2 is, independently, hydrogen, halo of atomic weight no greater than 36 or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both an alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms;

n is 0 or 1,

each of R_3, R_3', R_4 and R_4' is hydrogen or alkyl of 1 to 3 carbon atoms provided that at least one but not more than three of R_3, R_3', R_4 and R_4' is alkyl,

R is



X is a direct bond or $—(CH_2)_y—$

y is 1 to 3,

m is 0 to 2,

and of Y and Y′ is, independently, hydrogen, halo of atomic weight not greater than 36 or alkyl of 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 to 2 carbon atoms; or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 or 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y′ are hydroxy, further provided that neither of R_1 and R_2 is hydroxy when either of Y and Y′ is alkoxy and further provided that neither of Y and Y′ is hydroxy when either of R_1 and R_2 is alkoxy, or a pharmaceutically acceptable acid addition salt thereof.

3,905,977

OCTAHYDROMORPHANTHRIDINES

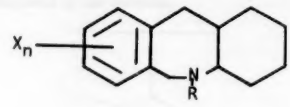
Edward Simon, East Brunswick; David B. Reisner, Hightstown; Bernard J. Ludwig, North Brunswick; John J. Harakal, Lakewood, and Milton Kletzkin, East Brunswick, all of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,275

Int. Cl.² C07D *223/20*

U.S. Cl. 260—239 D 15 Claims

1. A compound of the formula:



and the pharmaceutically accepted salts thereof wherein X is hydrogen, chlorine or lower alkyl, *n* is 1 except when X is chlorine *n* is 1 or 2 and R is hydrogen or lower alkyl.

3,905,978

4R-AMINO-1T-PHENYL-1C-ETHOXYCARBONYL-CYCLOHEXENES-(2) AND PROCESS FOR THEIR PREPARATION

Gerhard Satzinger, Denzlingen, and Manfred Herrmann, Gundelfingen, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

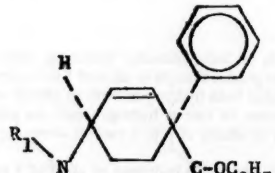
Continuation-in-part of Ser. No. 226,509, Feb. 15, 1972. This application July 27, 1973, Ser. No. 383,421

Claims priority, application Germany, Feb. 18, 1971, 2107871

Int. Cl.² C07D *295/08*

U.S. Cl. 260—268 PH 6 Claims

1. A compound of formula I:



wherein R_1 and R_2 are alkyls having 1 to 4 carbon atoms or R_1 or R_2 together with the nitrogen atom form 4-phenyl piperazino, 4-(2-methoxy-phenyl) piperazino, piperidino, or 4-phenyl piperidino or pharmaceutically acceptable acid addition salts.

3,905,979

DIAZABICYCLOOCTANES AND DIAZABICYCLOHEPTANES

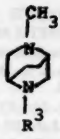
David W. Henry, Menlo Park, and Priscilla A. Sturm, Mountain View, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed May 9, 1974, Ser. No. 468,370

Int. Cl.² C07D *295/16*

U.S. Cl. 260—268 BF 4 Claims

1. A compound having the structure



R^3 is $-CON(C_2H_5)_2$,

or $-CONHC_2H_5$; or the pharmaceutically acceptable acid addition salts thereof.

3,905,980

3-SUBSTITUTED-2,4-DIHYDRO-BENZODIAZEPINES

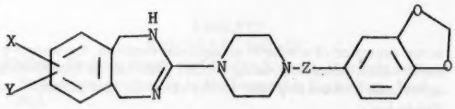
Richard A. Schnettler, Brown Deer, and John T. Suh, Mequon, both of Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 317,799, Dec. 22, 1972, Pat. No. 3,867,388. This application Oct. 2, 1974, Ser. No. 511,490

Int. Cl.² C07D *295/12, 295/18*

U.S. Cl. 260—268 BC 6 Claims

1. A compound selected from a compound of the formula



and pharmaceutically acceptable salts thereof, in which X and Y are hydrogen, hydroxy, halogen, or CF_3, lower alkoxy of 1 to 4 carbon atoms, and Z is

or $-CH_2-$.

3,905,981

N-DEALKYLATION OF TERTIARY AMINES

Roy A. Olofson, State College, Pa.; Rodney C. Schnur, Palo Alto, and Leonard A. Bunes, Redwood City, both of Calif., assignors to Research Corporation, New York, N.Y.

Filed Oct. 12, 1973, Ser. No. 406,098

Int. Cl.² C07D *489/00*

U.S. Cl. 260—285 18 Claims

1. A process for the mono N-dealkylation of tertiary amines selected from the group consisting of N,N-dimethyl-lower alkylamine, N-methyl-di-lower alkylamine, N-methyl-dicyclohexylamine, N,N-dimethylcyclohexylamine, N,N-diethylcyclohexylamine, N,N-dimethylbenzylamine, hordenine, N-methylpyrrolidine, N-ethyl-N-ethylpyrrolidine, nicotine, N-methylpiperidine, piperidine, arecoline, meperidine, tropine, atropine, hyoscyamine, scopolamine, cocaine, tropacocaine, morphine, codeine, O^3,O^6-diacetylmorphine, thebaine, N-methylmorphinans dihydrocodeinones, dihydromorphinones, 6,14-endo-ethanomorphines, erythromycin and tetracycline, which comprises the steps of replacing the N-alkyl group or one of the N-alkyl groups of said tertiary amine by a vinyloxycarbonyl group by reaction of said tertiary amine with a source of vinyloxycarbonyl groups selected from vinyl haloformates to thereby form a vinyloxycarbonyl amide of the corresponding secondary amine and thereafter cleaving said

vinyloxycarbonyl amide under mild acidic conditions with a hydrohalic acid and a hydroxylic reagent selected from the group consisting of water, a lower carboxylic acid and a lower alkanol to split off said vinyloxycarbonyl group from the amino N atom and obtain the corresponding secondary amine or hydrohalide salt thereof.

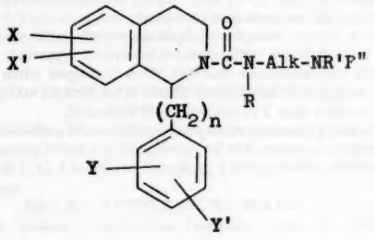
3,905,982

1-ARYL-N-DIALKYLAMINOALKYL-3,4-DIHYDRO-2(1H)-ISOQUINOLINECARBOXAMIDES AND RELATED COMPOUNDS

Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed July 23, 1973, Ser. No. 381,505
Int. Cl.² C07D *217/06*
U.S. Cl. 260—287 R **12 Claims**

1. A compound of the formula



wherein X and X′ are each selected from the group consisting of hydrogen, lower alkoxy, hydroxy, benzyloxy and methyl, or X and X′ together represent a single methylenedioxy or ethylenedioxy group; Y and Y′ are each selected from the group consisting of hydrogen, halogen and lower alkoxy; *n* is selected from the group consisting of 0 and 1; R is selected from the group consisting of hydrogen and lower alkyl, Alk is lower alkylene of 2 to 6 carbon atoms separating the nitrogen atoms attached thereto by at least 2 carbon atoms; and NR′R″ is selected from the group consisting of di(lower alkyl) amino, N-cyclohexyl(lower alkylamino), 1-pyrrolidinyl, hexamethyleneimino, piperidino, 4-phenylpiperidino, and 4-benzylpiperidino,.

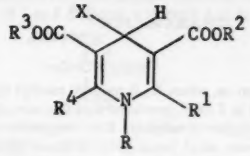
3,905,983

3,5,6-TRICARBOXY- AND 2,3,5,6-TETRACARBOXY-1,4-IHYDROPYRIDINE DERIVATIVES

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 24, 1973, Ser. No. 399,850
Claims priority, application Germany, Sept. 30, 1972, 2248150
Int. Cl.² C07D *213/80*
U.S. Cl. 260—294.8 G **14 Claims**

1. A compound of the formula



or a pharmaceutically-acceptable, nontoxic salt thereof, wherein

R is hydrogen, alkyl of up to 4 carbon atoms or alkenyl of up to 4 carbon atoms;

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R^2 is alkyl of up to 6 carbon atoms, alkenyl of up to 6 carbon atoms, said alkyl substituted by hydroxyl, said alkenyl substituted by hydroxyl, said alkyl interrupted by oxygen or said alkenyl interrupted by oxygen;

R^3 is alkyl of up to 6 carbon atoms or alkenyl of up to 6 carbon atoms;

R^4 is $-(CH_2)_n-CO-OR^5$,

wherein R^5 is hydrogen or alkyl of 1 to 4 carbon atoms and *n* is 0, 1, 2 or 3; and

X is phenyl; phenyl substituted by 1 or 2 nitro moieties, 1 cyano moiety, 1 azido moiety, 1 or 2 trifluoromethyl moieties, 1 $-SO_n$ alkyl wherein *n* is 0 or 2 and alkyl is of 1 to 4 carbon atoms, 1 or 2 alkyl moieties of 1 to 4 carbon atoms, 1, 2 or 3 alkoxy moieties of 1 to 4 carbon atoms, 1 or 2 acetoxy moieties, 1 or 2 amino moieties, 1 or 2 acetylamino moieties, 1 or 2 alkylamino moieties of 1 to 4 carbon atoms, 1 or 2 dialkylamino moieties of 1 to 4 carbon atoms in each alkyl group, 1 to 3 chlorine, bromine or fluorine atoms, or by 1 phenyl moiety; naphthyl; benzyl; or phenethyl.

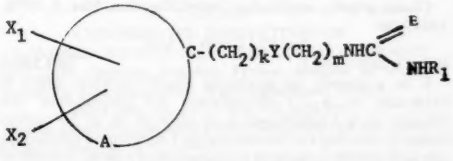
3,905,984

PYRIDYL SUBSTITUTED THIOALKYL-AND OXYALKYL-THIOUREAS AND UREAS

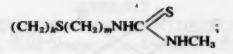
Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation-in-part of Ser. No. 290,584, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Mar. 13, 1974, Ser. No. 450,937
Int. Cl.² C07D *213/44*
U.S. Cl. 260—294.8 H **13 Claims**

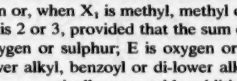
1. A compound of the formula:



wherein A is such that there is formed together with the carbon atoms shown a pyridine ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, halogen, amino or



X_2 is hydrogen or, when X_1 is methyl, methyl or halogen, k is 1 or 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen or sulphur; E is oxygen or sulphur; R_1 is hydrogen, lower alkyl, benzoyl or di-lower alkylamino-lower alkyl or a pharmaceutically acceptable addition salt thereof; with the proviso that X_1 is



only when Y and E are sulphur and R_1 is methyl and X_1 is nonadjacent to the other alkylthioalkylthiourea group.

3,905,985

1-ALKYL-2-(PYRIDYLSULFINYLMETHYL)-5-NITRO-IMIDAZOLES AND 1-ALKYL-2-(PYRIDYLSULFONYLMETHYL)-5-NITRO-IMIDAZOLES

Erhardt Winkelmann, Kelkheim, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

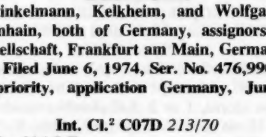
Filed June 6, 1974, Ser. No. 476,990

Claims priority, application Germany, June 8, 1973, 2329376

Int. Cl.² C07D *213/70*

U.S. Cl. 260—294.8 F **19 Claims**

1. A compound of the formula



in which R stands for a methyl, ethyl or hydroxyethyl group and Z stands for —SO— or —SO_2— and the pyridine ring is linked to the sulfinyl or the sulfonyl group in 2, 3 or 4 position.

3,905,986

MANUFACTURE OF 1,1-DISUBSTITUTED-4,4-BIPYRIDYLIUM SALTS

John Edward Colchester, and Thomas Blundell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 118,565, Feb. 24, 1971, Pat. No. 3,787,426. This application Jan. 21, 1974, Ser. No. 435,266

Claims priority, application United Kingdom, Mar. 5, 1970, 10679/70

Int. Cl.² C07D *213/38*

U.S. Cl. 260—296 D **28 Claims**

1. In a process for producing dihydrobipyridyl which is oxidizable to a 1,1'-disubstituted 4,4'-bipyridylium salt wherein each 1-substituent is an alkyl of up to 10 carbon atoms by reacting the corresponding 1-substituted pyridinium salt with soluble cyanide in the presence of a protic solvent or a protic solvent and an added alkali metal base or ammonium base, the improvement consisting essentially of producing the corresponding hydroxyalkyl derivative by reacting the corresponding hydroxy substituted alkayl 1-substituted pyridinium salt in the said process.

3,905,987

M-DIOXANE-5-METHYLAMINE ANALGESICS

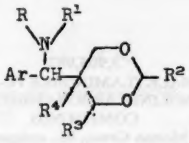
Richard N. Booher, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 313,221, Dec. 8, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,944

Int. Cl.² C07D *213/46, 319/04*

U.S. Cl. 260—296 R **13 Claims**

1. A compound of the formula



wherein

R is hydrogen, C_1–C_4 alkyl, C_3–C_4 alkenyl or benzyl;

R^1 is C_1–C_4 alkyl, C_3–C_4 alkenyl or benzyl;

R and R^1, when taken together with the nitrogen atom to which they are attached, are aziridino, pyrrolidino or piperidino;

R^2 is hydrogen, C_1–C_3 alkyl, C_2–C_3 alkenyl or phenyl;

R^3 and R^4 are hydrogen or methyl;

Ar is phenyl, halophenyl, hydroxyphenyl, methoxyphenyl, methylphenyl, trifluoromethylphenyl or 3-pyridyl;

with the limitations that (a) R^2 is hydrogen when R^3 is methyl, (b) only one of R^3 and R^4 is methyl, and (c) Ar is other than 3-pyridyl when R^3 is methyl;

and the pharmaceutically-acceptable acid-addition salts thereof.

3,905,988

PROCESS FOR THE PREPARATION OF 2 THION-OXAZOLIDINONES AND DERIVATIVES THEREOF

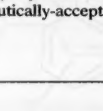
Johannes J. Daalmans, Maastricht, and Wilhelmus H. J. Boesten, Sittard, both of Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Feb. 18, 1971, Ser. No. 116,311

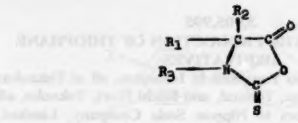
Claims priority, application Netherlands, Feb. 18, 1970, 7002228

Int. Cl.² C07D *85/26*

U.S. Cl. 260—307 B **6 Claims**



1. Process for preparing a 2-thion-oxazolidinone-5-compound of the formula



wherein R_1 is hydrogen or the group bonded to the α-carbon atom of a natural α-amino acid, R_2 is hydrogen and R_3 is hydrogen or when taken together with R_1 forms the proline or O-protected hydroxyproline ring comprising the step of reacting in an inert liquid organic reaction medium the corresponding tertiary lower alkyl ester of an α-isothiocyanate carboxylic acid or of an N-thiocarbonyl chloride compound of a natural α-amino acid while continuously passing gaseous hydrogen chloride through the reaction medium until completion of the reaction at a temperature of between about −40° C and +80° C.

3,905,989

(TETRAZOLYL)THIOXANTHONE-10,10-DIOXIDES

Harold F. Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 18, 1973, Ser. No. 361,523

Claims priority, application United Kingdom, May 19, 1972, 23805/72; Sept. 6, 1972, 41429/72; May 4, 1973, 21174/73

Int. Cl.² C07D *335/16, 409/10*

U.S. Cl. 260—308 D **3 Claims**

1. 3-(5-Tetrazolyl)thioxanthone-10,10-dioxide and pharmaceutically acceptable salts thereof.

3,905,990

BASICALLY SUBSTITUTED BENZIMIDAZOLE DERIVATIVES

Oskar Ehrmann, Mannheim; Frank Zimmermann, Neustadt, and Ludwig Friedrich, Mannheim, all of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

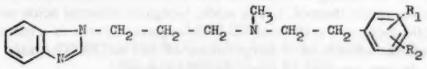
Filed Dec. 12, 1973, Ser. No. 424,120

Claims priority, application Germany, Jan. 2, 1973, 2300018

Int. Cl.² C07D *235/04*

U.S. Cl. 260—309.2 **14 Claims**

1. Compound of the formula



wherein R_1 is H, Cl, OH, lower alkyl or lower alkoxy and R_2 is H, Cl or lower alkoxy, and salts thereof with physiologically acceptable acids.

3,905,991

2-BENZIMIDAZOLECARBAMIC ACID ESTERS BY THE CYANAMIDE PROCESS

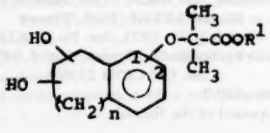
Rudolph Schlatter, Chadds Ford, Pa., and Charles De Witt Adams, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 745,403, July 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 674,739, Oct. 12, 1967, abandoned, which is a continuation-in-part of Ser. No. 594,384, Nov. 15, 1966, abandoned. This application June 25, 1969, Ser. No. 836,580

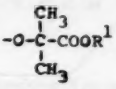
Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **13 Claims**

1. A compound of the formula:



wherein R^1 is selected from the group consisting of hydrogen and lower alkyl of 1 to 8 carbons; *n* is zero, 1 or 2; the



side chain is in either the 1 or 2 position; and the pharmaceutically acceptable salts thereof

4. A process for making a 2-benzimidazolecarbamic acid ester comprising reacting an alkyl cyanocarbamate salt of the following formula:

$$[HNR_5R_6R_7]\cdot[N(CN)CO_2R]$$

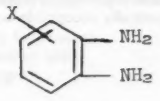
where

R_5 and R_6 are alkyl of 1 through 4 carbon atoms; and

R_7 is alkyl of 1 through 4 carbon atoms;

R is alkyl of 1 through 4 carbon atoms;

with an o-phenylenediamine of the following formula:



where X is hydrogen, halogen, nitro or alkyl of 1 through 4 carbon atoms; in an acidic medium at a pH of 1 to 6 until the precipitation of a 2-benzimidazolecarbamic acid ester is complete, and recovering said 2-benzimidazolecarbamic acid ester from the reaction mixture.

3,905,992

N,N′-ALKYLENEBIS[2-AMINO-1-(2-IMIDAZOLIN-2-YL)-IMIDAZOLINES]

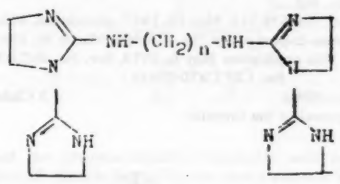
Raymond R. Wittekind, Morristown, and John Shavel, Jr., Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 11, 1973, Ser. No. 396,166

Int. Cl.² C07G *49/34*

U.S. Cl. 260—309.6 **8 Claims**

1. A compound of the formula:



wherein *n* is an integer from 4 to 12 and X is the pharmaceutically acceptable iodide ion.

3,905,993

CHLORINATED DERIVATIVES OF 1-(2-Δ²-IMIDAZOLINYL)-2,2-DIARYLCYCLOPROPANES

Jean-Claude Cognaco, Garches, France, assignor to Societe Anonyme dite: Hexachime, Rueil Malmaison, France

Filed Nov. 23, 1973, Ser. No. 418,178

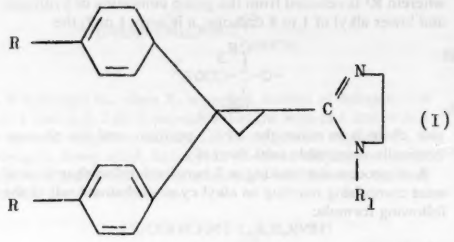
Claims priority, application United Kingdom, Nov. 30, 1972, 55278/72; Feb. 6, 1973, 5774/73

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **4 Claims**

1. Chlorinated 1-(2-Δ²-imidazolinyl)-2,2-diaryl-cyclopropanes selected from the group comprising:

a. compounds corresponding to the general formula



(I)

in which R_1 represents the hydrogen atom, the benzyl group or a monochlorinated or polychlorinated benzyl group, and R represents the chlorine atom and, where R_1 contains at least one chlorine atom, can represent hydrogen; and

b. their pharmaceutically acceptable acid addition salts.

3,905,994

2-[2-(1,3-DIAZACYCLOALK-2-ENYL]BENZOPHENONE DERIVATIVES AND 1,3-DIAZACYCLOALKENYL[2,1-A]ISOINDOLE DERIVATIVES

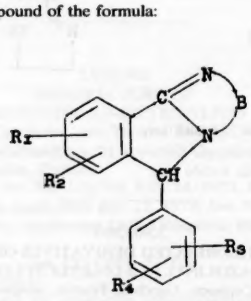
Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 639,315, May 18, 1967, abandoned, which is a continuation-in-part of Ser. No. 626,965, March 30, 1967, abandoned. This application May 6, 1974, Ser. No. 467,031

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.6 3 Claims

1. A compound of the formula:



wherein B represents an alkylene chain of 2 carbon atoms in which one or more of the hydrogens can be replaced by lower alkyl; and R_1, R_2, R_3, and R_4 are each independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, and trifluoromethyl.

3,905,995

PROCESS FOR THE PRODUCTION OF THIOPHANE DERIVATIVES

Kichiji Enoki; Toshio Yao; Keiichi Ishimitsu, all of Takaoka; Keiichi Tsukashima, Tonami, and Eiichi Ikari, Takaoka, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

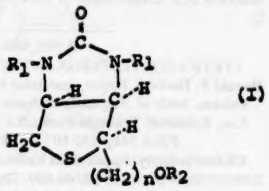
Filed Jan. 2, 1974, Ser. No. 429,916

Claims priority, application Japan, Dec. 25, 1972, 48-2525; Jan. 19, 1973, 48-7863; Feb. 19, 1973, 48-19214; Mar. 17, 1973, 48-31184; July 19, 1973, 48-80478

Int. Cl.² C07D *49/34*

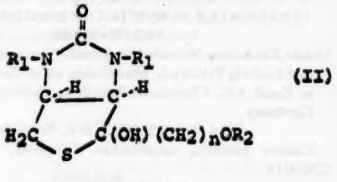
U.S. Cl. 260—309.7 10 Claims

1. A process for the production of a compound having the general formula



(I)

wherein R_1 is benzyl, and R_2 is selected from the group consisting of alkyl, phenyl and benzyl, and *n* is an integer of 1 to 6, which comprises reducing a starting material selected from the compound having the general formula



(II)

with hydrogen in the presence of sulfur resistant nickel catalyst and one or more of auxiliary catalysts selected from the group consisting of aliphatic, aromatic and aralkyl carboxylic acids, esters thereof, Lewis acids, inorganic mineral acids and solid inorganic acid catalysts in an organic solvent or a mixed organic solvent at a temperature of 60° to 200°C under a hydrogen pressure of more than 30 kg/cm².

3,905,996

IMIDAZOLIDONES

Jacques Perronnet, and André Teche, both of Paris, France, assignors to Roussel-UCLAF, Paris, France

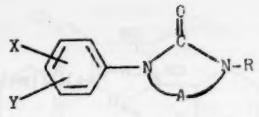
Filed July 31, 1973, Ser. No. 384,197

Claims priority, application France, Aug. 4, 1972, 72.28191

Int. Cl.² C07D *233/02*

U.S. Cl. 260—309.7 5 Claims

1. A compound of the formula



wherein A is ethylene, X is selected from the group consisting of hydrogen, halogen, $-CF_3$, $-NO_2$, acetyl, alkyl and alkoxy of 1 to 6 carbon atoms and alkenyloxy of 2 to 6 carbon atoms optionally substituted with halogen, Y is selected from the group consisting of hydrogen, halogen and alkyl and alkoxy of 1 to 6 carbon atoms and R is selected from the group consisting of alkoxy of 1 to 4 carbon atoms and alkoxycarbonyl of 2 to 6 carbon atoms.

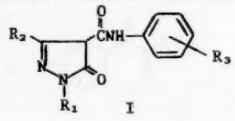
3,905,997

3-ARYL-5-OXO-2-PYRAZOLINE-4-CARBOXANILIDES AND PROCESS THEREFOR

Harold Zinnes, Rockaway, and Neil A. Lindo, Chatham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 21, 1974, Ser. No. 481,925
Int. Cl.² C07D *231/08*
U.S. Cl. 260—310 A **4 Claims**

1. A compound of the formula:



wherein R_1 is alkyl of 1 to 7 carbon atoms, or phenyl; R_2 is phenyl; R_3 is hydrogen, or the corresponding alkali metal salt.

3,905,998

1,2,3,4 TETRAHYDROCARBAZOLE-3-CARBOXYLIC AND 4-CARBOXYLIC ACIDS

Ernest John Alexander, Greenbush, and Aram Mooradian, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 200,205, Nov. 18, 1971, Pat. No. 3,758,496, which is a continuation-in-part of Ser. No. 42,620, June 2, 1970, Pat. No. 3,687,969. This application Dec. 11, 1972, Ser. No. 314,099
Int. Cl.² C07D *209/88*
U.S. Cl. 260—315 **5 Claims**

1. 6-Benzyloxy-1,2,3,4-tetrahydrocarbazole-3-carboxylic acid.

3,905,999

SYNTHESIS OF 2,3-SUBSTITUTED INDOLES

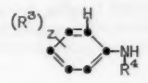
James J. Krutak, Sr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 264,687, June 20, 1972, abandoned. This application May 1, 1974, Ser. No. 465,980
Int. Cl.² C07D *209/04, 209/08*
U.S. Cl. 260—319.1 **3 Claims**

1. A method of preparing 2,3-substituted indoles which comprises the steps of:

admixing 1 mole proportion of a compound having the formula

to at least 1 mole proportion of an amine having the formula



and heating the admixture for at least about 30 minutes at a temperature between 100° and about 210°C.;

wherein

R^1 and R^2 are lower alkyl;

R^3 is hydrogen, lower alkyl or lower alkoxy;

z is 1 or 2;

R^4 is hydrogen or lower alkyl;

X is chloro or bromo; and

Y represents oxygen.

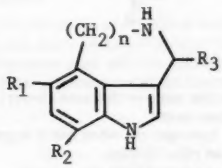
3,906,000

TRICYCLICAZAINDOLE DERIVATIVES

James M. McManus, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 228,743, Feb. 23, 1972, Pat. No. 3,833,591. This application Mar. 1, 1974, Ser. No. 447,073
Int. Cl.² C07D *207/12*
U.S. Cl. 260—326.5 B **4 Claims**

1. A compound selected from the group consisting of tricyclicazaindole bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 and R_2 are each a member selected from the group consisting of hydrogen and methoxy; n is 2 and R_3 is a member selected from the group consisting of alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, phenylalkyl having up to 3 carbon atoms in the alkyl moiety, phenyl, chlorophenyl, tolyl, anisyl and thienyl.

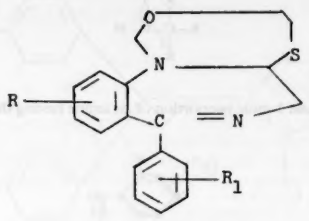
3,906,001

1,2,-HETEROCYCLIC-1,4-BENZODIAZEPINES

David Llewellyn Coffen, Glenridge, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 383,362, July 27, 1973, Pat. No. 3,850,948. This application Aug. 28, 1974, Ser. No. 501,314
Int. Cl.² C07D *515/04*
U.S. Cl. 260—327 R **2 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, halogen, lower alkyl, trifluoromethyl, nitro, cyano, lower alkoxy and lower alkylthio; R_1 signifies hydrogen or halogen and the pharmaceutically acceptable acid addition salts thereof.

3,906,002

HINDERED PHENOLIC NORBORNANE-2,3-DICARBOXIMIDES

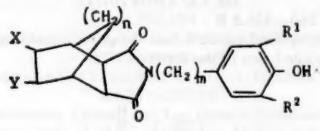
John F. Stephen, 24 Mill Creek Rd., New City, N.Y. 10956

Filed Dec. 28, 1973, Ser. No. 429,235

Int. Cl. C07d *27/48*

U.S. Cl. 260—326 C **11 Claims**

1. A compound of the formula



wherein

R^1 and R^2 are the same or different (lower) alkyl groups of 1 to 4 carbon atoms,

X and Y are hydrogen or, when taken together, they form a bond or an ether linkage,

m has a value of 0 to 3, and

n has a value of 0 to 2.

3,906,003

BENZODIAZEPINE DERIVATIVES AND PREPARATION THEREOF

Mitsuhiro Akatsu, Toyonaka; Yoshiharu Kume, Takarazuka; Toshiyuki Hirohashi, Ashiya; Shigeho Inaba, Takarazuka; Hisao Yamamoto, Nishinomiya, and Hiromi Sato, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

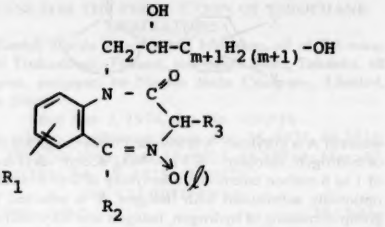
Filed Nov. 1, 1971, Ser. No. 194,690

Claims priority, application Japan, Nov. 16, 1970, 45-101332; Nov. 21, 1970, 45-102951; Nov. 28, 1970, 45-105103; Nov. 28, 1970, 45-105105; Nov. 28, 1970, 45-105106; Dec. 8, 1970, 45-109966; Dec. 9, 1970, 45-109770; Dec. 11, 1970, 45-114462

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D **6 Claims**

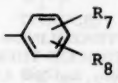
1. A benzodiazepine represented by the formula



wherein

R_1 represents hydrogen, halogen, nitro or trifluoromethyl;

R_2 represents pyridyl, cyclohexenyl or a group of the formula



wherein R_7 and R_8 each represents hydrogen, halogen, lower alkyl or trifluoromethyl;

R_3 represents hydrogen, lower alkyl, phenyl, naphthyl, mono- or disubstituted phenyl wherein the substituent is halogen, lower alkyl, lower alkoxy, nitro and trifluoromethyl; benzyl, phenethyl, β-phenylpropyl or naphthethyl; *l* represents 0 or 1; and *m* represents 0, 1, 2, or 3.

3,906,004

STEREOSELECTIVE SYNTHESIS OF INTERMEDIATE FOR PREPARATION OF MESO-NORDIHYDROGUAIARETIC ACID

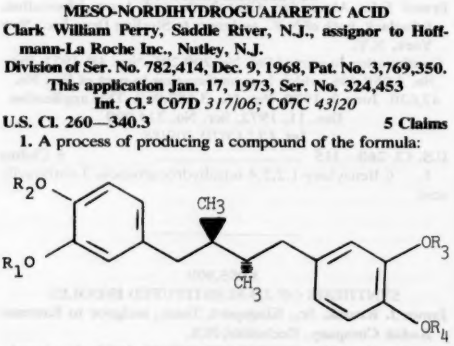
Clark William Perry, Saddle River, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 782,414, Dec. 9, 1968, Pat. No. 3,769,350. This application Jan. 17, 1973, Ser. No. 324,453

Int. Cl.² C07D *317/06;* **C07C** *43/20*

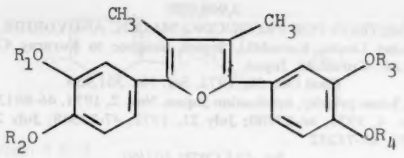
U.S. Cl. 260—340.3 **5 Claims**

1. A process of producing a compound of the formula:



wherein R_1 and R_2 are lower alkyl, aralkyl, and taken together form a lower alkylene radical and R_3 and R_4 are selected from the group consisting of lower alkyl, aralkyl, and taken together form a lower alkylene radical;

comprising hydrogenating a heterocyclic compound of the formula:



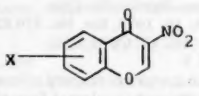
wherein R_1, R_2, R_3 and R_4 are as above;
in the presence of a catalyst selected from the group consisting of palladium oxide, palladium chloride, hydrogenated palladium oxide and hydrogenated palladium chloride in an inert solvent selected from the group consisting of tetrahydrofuran, ethyl acetate, dioxane, and diethylether.

3,906,005
3-NITROCHROMONES

Sylvester Klutchko, Hackettstown, and Maximilan von Strandtmann, Rockaway Twp., both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 11, 1974, Ser. No. 460,255
Int. Cl.² C07D *311/22*
U.S. Cl. 260—345.2 **3 Claims**

1. A compound of the formula



I

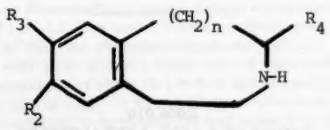
wherein X is hydrogen, halogen, nitro, phenyl, acetyl or methylsulfonyl.

3,906,006
PREPARATION OF 2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES AND 1,2,3,4,5,6-HEXAHYDRO-3-BENZAZOCINES

Arnold Brossi, Verona; Benjamin Pecherer, Montclair, and Robert Sunbury, Wayne, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

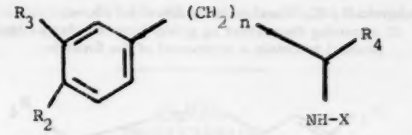
Division of Ser. No. 65,340, Aug. 19, 1970, Pat. No. 3,795,683. This application Oct. 1, 1973, Ser. No. 402,536
Int. Cl.² C07D *223/16, 225/06, 317/62*
U.S. Cl. 260—340.5 **1 Claim**

1. A process for the preparation of compounds of the formula

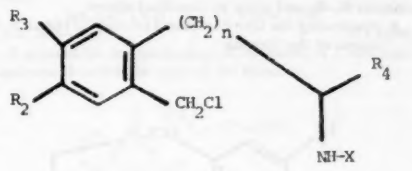


wherein R_2 and R_3 each independently signify lower alkoxy, or taken together signify methylenedioxy; R_4 signifies hydrogen, lower alkyl, carboxy, aryl, or ary substituted by a member selected from the group consisting of halogen, lower alkyl, nitro, or trifluoromethyl; and N is 1 or 2 which comprises:

A. reacting a compound of the formula

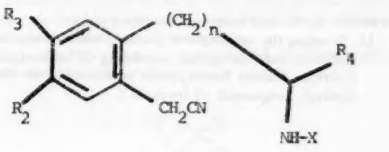


wherein R_2–R_4 and *n* are as described above and X signifies a suitable protecting group selected from the group consisting of acyl and phthaloyl groups, with formaldehyde and hydrogen chloride in an inert organic solvent to obtain a compound of the formula



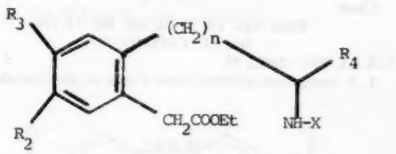
wherein R_2–R_4, X and *n* are as described above;

B. treating the above-obtained product with an alkali metal cyanide to obtain a compound of the formula



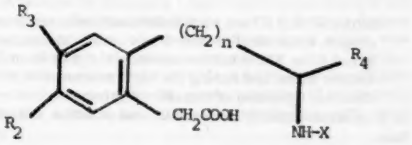
wherein R_2–R_4, X and *n* are as described above;

C. Refluxing the above-obtained product in absolute alcohol and anhydrous acid with the subsequent addition of water to obtain a compound of the formula



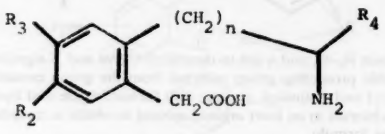
wherein R_2–R_4, X and *n* are as described above;

D. Treating the above-obtained product in an aqueous solution of acidic or basic catalysts to obtain a compound of the formula



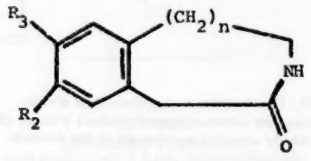
wherein R_2–R_4, X and *n* are as described above;

E. removing the protecting group from the above-obtained product to obtain a compound of the formula



wherein R_2–R_4 and *n* are as described above;

F. condensing the above-obtained product to obtain a compound of the formula



wherein R_2–R_4 and *n* are as described above;

G. Treating the so-obtained product with a reducing agent selected from the group consisting of lithium aluminum hydride, lithium borohydride and borane to obtain the desired compounds of formula I.

3,906,007

BIS-BASIC KETONES OF DIBENZOFURAN

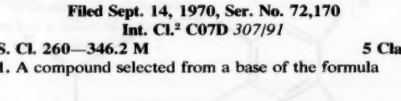
William L. Albrecht, and Robert W. Fleming, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Sept. 14, 1970, Ser. No. 72,170

Int. Cl.² C07D *307/91*

U.S. Cl. 260—346.2 M **5 Claims**

1. A compound selected from a base of the formula



wherein A is a straight or branched alkylene chain of from 1 to 6 carbon atoms and each Y is the group

wherein R^1 and R^2 are each individually selected from hydrogen, lower alkyl of from 1 to 4 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, alkenyl or from 3 to 6 carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group;

or a pharmaceutically acceptable acid addition salt of said base.

3,906,008

METHOD FOR PRODUCING MALEIC ANHYDRIDE

Ryuhei Ueeda, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 30, 1972, Ser. No. 301,933

Claims priority, application Japan, Nov. 2, 1971, 46-88132; Nov. 4, 1971, 46-87780; July 21, 1972, 47-73548; July 27, 1972, 47-75252

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 A **10 Claims**

1. A method for preparing maleic anhydride which comprises oxidizing an olefinic hydrocarbon containing four or five carbon atoms or a hydrocarbon mixture thereof in a reaction zone at a temperature from 250° to 650°C. in the presence of a catalyst consisting of the oxides of tungsten and phosphorus, the atomic ratio of tungsten to phosphorus being less than 30.

3,906,009

OXIDATIVE DEHYDROGENATION OF ALKENES OF ALKADIENES TO FURAN COMPOUNDS USING CERTAIN V-P CATALYTS

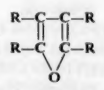
Floyd E. Farha, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 16, 1973, Ser. No. 379,824

Int. Cl. C07d *5/16*

U.S. Cl. 260—346.1 R **9 Claims**

1. A process which comprises reacting at least one unsaturated acyclic feed hydrocarbon selected from the group consisting of alkenes and alkadienes having 4 to 10 carbon atoms, with oxygen in contact with a catalyst consisting essentially of phosphorus, vanadium and oxygen, wherein the atom ratio of vanadium to phosphorus is in the range of about 2:1 to about 12:1, under suitable reaction conditions for conversion of said at least one unsaturated acyclic feed hydrocarbon to at least one furan compound having the formula



wherein each R is individually selected from the group consisting of hydrogen and alkyl radicals having from 1 to 6 carbon atoms, the total carbon atoms in the R radicals being in the range of 0 to 6; and recovering at least a portion of the furan compounds thus produced.

3,906,010

SERIES OF 5-ARYL-2-FURAMIDINES

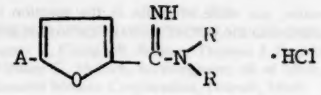
Stanford S. Pelosi, Jr.; Ronald E. White; Ralph L. White, Jr.; George C. Wright, and Chia-Nien You, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed June 17, 1974, Ser. No. 479,830

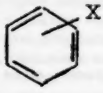
Int. Cl. C07d *5/16*

U.S. Cl. 260—347.5 **28 Claims**

1. A compound of the formula:



wherein A is or



with X representing hydrogen, nitro, amino, halo, dihalo, 4-(lower)alkyl, 3-trifluoromethyl, 3,4-dimethoxy, 4-methyl-3-chloro, 4-alkoxy, 4-dimethylamino, 4-ethoxycarbonyl, 4-hydroxy, 4-methylthio, 4-(1-hydroxy)ethyl, or 4-acetyl, and R represents hydrogen or ethyl.

3,906,011
PROCESS FOR THE PREPARATION OF 1,5- AND 1,8-DINITROANTHRAQUINONE

Wolfgang Auge, Odenthal; Karl-Werner Thiem, Cologne, and Rutger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 8, 1974, Ser. No. 440,829

Claims priority, application Germany, Feb. 10, 1973, 2306611

Int. Cl.² C07C *79/37*

U.S. Cl. 260—369 **8 Claims**

1. Process for the preparation of 1,5- and/or 1,8-dinitroanthraquinone which is practically free of 1,6- and 1,7-dinitroanthraquinone, characterised in that anthraquinone and/or 1-nitroanthraquinone or anthraquinone nitration mixtures which contain anthraquinone and/or 1-nitroanthraquinone are nitrated in nitric acid having a concentration of 90% or more at a molar ratio of nitric acid to the said anthraquinones of at least 12:1 from 0°C to the boiling point of the nitric acid to give dinitroanthraquinone and thereafter 1,5-dinitroanthraquinone is directly precipitated from the reaction mixture by adjusting the molar fraction of nitric acid to a value of $\gamma_{HNO_3} = 0.90$ to 0.68 at molar ratios of nitric acid:dinitroanthraquinone of 10:1 to 80:1 and is isolated in the usual manner, 1,8-dinitroanthraquinone is then precipitated from the filtrate by adjusting the molar fraction of nitric acid to a value of $\gamma_{HNO_3} = 0.80$ to 0.50 at molar ratios of nitric acid:dissolved dinitroanthraquinones of 10:1 to 80:1 and is isolated in the usual manner, or 1,5-and 1,8-dinitroanthraquinone are precipitated together directly after the nitration by adjusting the molar fraction of nitric acid to a value of $\gamma_{HNO_3} = 0.80$ to 0.50 at molar ratios of nitric acid:dinitroanthraquinones of 10:1 to 80:1 and are isolated in the usual manner.

8. Process for isolating 1,5- and/or 1,8-dinitroanthraquinone from dinitroanthraquinone mixtures which consist essentially of 1,5-, 1,8-, 1,6- and 1,7-dinitroanthraquinone, characterised in that the dinitroanthraquinone mixtures are first treated with nitric acid at a molar ratio of nitric acid to dinitroanthraquinone of about 10:1 to 80:1 and at a molar fraction of nitric acid of $\gamma_{HNO_3} = 0.90$ to 0.68, the undissolved 1,5-dinitroanthraquinone is separated off and isolated in the usual manner and thereafter 1,8-dinitroanthraquinone is precipitated from the filtrate by adjusting the molar fraction of nitric acid to a value of $\gamma_{HNO_3} = 0.80$ to 0.50 at molar ratios of nitric acid:dinitroanthraquinones of 10:1 to 80:1 and is isolated in the usual manner, or that 1,5- and 1,8-dinitroanthraquinone are together separated from the dinitroanthraquinone mixture by adjusting the molar fraction of nitric acid to a value of $\gamma_{HNO_3} = 0.80$ to 0.50 at molar ratios of nitric acid:dinitroanthraquinones of 10:1 to 80:1 and are isolated in the usual manner.

3,906,012
PRODUCTION OF 1-AMINOANTHRAQUINONE-2-CARBOXAMIDES

Alfred Schuhmacher, and Gerd Schwantje, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

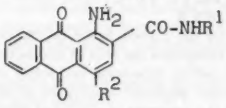
Filed Nov. 5, 1973, Ser. No. 412,562

Claims priority, application Germany, Nov. 9, 1972, 2254838

Int. Cl.² C07C *103/75;* **C09B** *1/36*

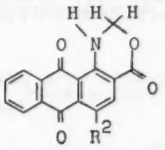
U.S. Cl. 260—377 **10 Claims**

1. A process for the production of an amide of 1-aminoanthraquinone-2-carboxylic acid of the formula:



in which R^1 is hydrogen, cycloalkyl of five to eight carbon atoms, alkyl of one to eight carbon atoms or said alkyl substituted once or twice by hydroxyl, alkoxy of one to six carbon atoms, phenyl or said phenyl substituted by alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, chloro or bromo, and R^2 is hydrogen, cyclohexylamino, chloro, bromo or nitro, which process comprises:

reacting a 1,2-hydro-7,8-diphthaloyl-3,1,4-H-benzoxazone -4 of the formula



with an amine of the formula:

$$R^1—NH_2$$

where R^1 and R^2 have the above meanings.

3,906,013
PROCESS FOR THE MANUFACTURE OF NITRO-HYDROXY-ANTHRAQUINONES

Karl-Julius Reubke, Cologne; Walter Hohmann, Leverkusen, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 6, 1973, Ser. No. 413,228

Claims priority, application Germany, Nov. 6, 1972, 2254199

Int. Cl.² C07C *49/75*

U.S. Cl. 260—383 **8 Claims**

1. A process for preparing 1-hydroxy-5-nitro-anthraquinone from 1,5- dinitroanthraquinone, or 1-hydroxy-8-nitro-anthraquinone from 1,8- dinitro-anthraquinone which comprises reacting 1,5-dinitro-anthraquinone or 1,8-dinitro-anthraquinone in a polar aprotic solvent with an alkaline compound selected from the group consisting of alkali metal hydroxide, alkali metal carbonate and alkaline earth metal oxide.

3,906,014
3-DEOXY-1α-HYDROXYCHOLECALCIFEROL

Hector F. DeLuca, Madison; Heinrich K. Schnoes, Waunakee, and Hing-Yat Lam, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed June 17, 1974, Ser. No. 480,211
Int. Cl.² C07J *9/00*
U.S. Cl. 260—397.2 **3 Claims**

1. 3-deoxy-1α-hydroxycholecalciferol.

3,906,015
CARBOALKOXYLATION AND CARBOALKOXYLATION OF OLEFINS

Joseph J. Mrowca, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 189,834, Oct. 18, 1971, Pat. No. 3,776,929. This application Oct. 29, 1973, Ser. No. 410,395
Int. Cl.² C07C *67/38, 51/14*
U.S. Cl. 260—410.9 R **6 Claims**

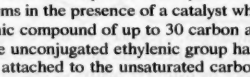
1. A process for the carboxylation or carboalkoxylation of an olefin which comprises the step of contacting and reacting said olefin with carbon monoxide and water or a primary or secondary saturated aliphatic or alicyclic alcohol of up to 10 carbon atoms in the presence of a catalyst wherein said olefin is an organic compound of up to 30 carbon atoms containing at least one unconjugated ethylenic group having at least two hydrogens attached to the unsaturated carbon atoms, free of amine groups and free of hydroxy or halide substituents closer than two carbon atoms from the ethylenic group;

said catalyst having the formula

$$L_2MXY$$

wherein M is Pt or Pd

X and Y, alike or different are chlorine, bromine, iodine, alkyl of up to five carbon atoms, cyano, alkanoyl of 2-5 carbon atoms, aroyl of up to 12 carbon atoms and when X does not equal Y, one of X and Y can be hydrogen; and L is



in which X is O or S;

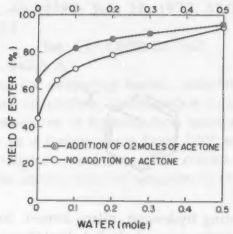
R^1, R^2, R^3, R^4 and R^5 are selected from linear or branched alkyl of up to 10 carbon atoms; aryl of up to 12 carbon atoms; aryl of up to 12 carbon atoms substituted with up to 5 lower alkyl groups or lower alkoxy groups, each containing up to 4 carbon atoms, up to 5 halogen atoms, up to 3 cyano groups, up to 3 lower alkoxycarbonyl groups or up to 3 trifluoromethyl groups; aralkyl of up to 12 carbon atoms and R^4 and R^5 taken jointly can be o-arylene of up to 12 carbon atoms or $-(CH_2)_n-$ wherein n is 2 or 3.

3,906,016
METHOD OF PREPARING ESTERS OF CARBOXYLIC ACIDS

Hiroshi Isa, Funabashi; Takeo Inagaki, Yachiyo; Yasuhiro Kiyonaga, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1972, Ser. No. 317,389
Claims priority, application Japan, Dec. 28, 1971, 47-2766; Dec. 28, 1971, 47-2768
Int. Cl.² C07C *67/38*
U.S. Cl. 260—410.9 R **6 Claims**

1. In a process for preparing esters of carboxylic acid, which comprises, in a reaction system, reacting olefin, alcohol and carbon monoxide gas containing up to 4.5 percent by volume of hydrogen, at a temperature of from 90° to 200°C and at a pressure of at least 60 kg/cm², in the presence of cobalt carbonyl catalyst, the improvement which comprises: adding to the reaction system at the start of the reaction from 0.2 to 1.5 moles of water, per mole of olefin in the reaction system, whereby to increase the yield of esters of carboxylic acids and



to minimize the amount of aldehyde by-products formed by the reaction.

3,906,017
PREPARATION OF DIARENE CHROMIUM COMPOUNDS

Robert Middleton; Peter Leslie Timms, both of Bristol, and Geoffrey Moorhouse Gibson, Leeds, all of England, assignors to British Chrome & Chemicals Limited, Stockton-on-Tees, England

Filed July 23, 1973, Ser. No. 381,428
Claims priority, application United Kingdom, July 24, 1972, 34551/72
Int. Cl.² C07F *11/00*
U.S. Cl. 260—438.5 R **15 Claims**

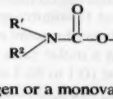
1. A process for preparing diarene chromium compounds, comprising condensing gaseous chromium atoms with at least one aromatic compound of formula Ar′ or Ar″, or a mixture thereof, at a pressure of less than 10^{-2} torr and at a temperature compatible with maintaining said pressure, wherein Ar′ is an alkylbenzene molecule in which the benzene ring is substituted by one or more alkyl groups, and Ar″ is a diphenyl, tetralin or indane molecule, each of which is unsubstituted or substituted by at least one alkyl group.

3,906,018
POLYSILOXANE CARBAMATE COMPOUNDS

Robert Leopold Ostrozynski, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 10, 1972, Ser. No. 252,331
Int. Cl.² C07F *7/10*
U.S. Cl. 260—448.2 N **6 Claims**

1. An essentially linear organopolysiloxane polymer, free from hydroxyl radicals which contains at least one N,N-diorganocarbamate radical of the formula



wherein R′ is hydrogen or a monovalent hydrocarbon radical and wherein R^2 is a monovalent hydrocarbon radical, all carbamate radicals of said polymer being directly bonded to a terminal silicon atom of said polymer and wherein the other substituent radicals directly bonded to the silicon atoms of said organopolysiloxane polymer are selected from the group consisting of hydrogen, monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals wherein the substitutents are selected from the class consisting of halogen, nitro, cyano and alkoxy radicals.

3,906,019

PREPARATION OF DI(ISOCYANATO-TOLYL) UREA

Gregory A. Campbell, Romeo; Thomas J. Dearlove, Troy, and William C. Mehuch, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1974, Ser. No. 463,991
Int. Cl.² C07C *118/00, 119/048*
U.S. Cl. 260—453 P 3 Claims

1. A method of preparing a di(isocyanato-tolyl) urea in substantially monomeric form comprising:

rapidly and thoroughly mixing liquid water and toluene diisocyanate in a reaction vessel at a temperature in the range of from room temperature to about 40° C. to form said urea, with said water and said diisocyanate being immiscible and forming two liquid phases in said mixture from which said urea separates as a solid product as it is formed, there being a stoichiometric excess of either said water or said diisocyanate which serves as a suspension medium for the other liquid reactant and the solid product, and

separating said urea from said medium.

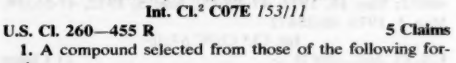
3,906,020

THIOLESTERS OF 3,7,11-TRIMETHYLDODECA-2,4,11-TRIENOIC ACID

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 305,042, Nov. 9, 1972. This application Feb. 25, 1974, Ser. No. 445,368
Int. Cl.² C07E *153/11*
U.S. Cl. 260—455 R 5 Claims

1. A compound selected from those of the following formula:



(A)

wherein,

R′ is lower alkyl, cycloalkyl, lower alkenyl or lower alkynyl.

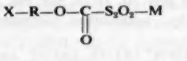
3,906,021

ALIPHATIC OXYCARBONYL THIOSULFATES

Martin K. O. Lindemann, Brookville, Md., assignor to The Gillette Company, Boston, Mass.

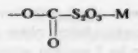
Filed Mar. 29, 1974, Ser. No. 456,044
Int. Cl.² C07C *154/00*
U.S. Cl. 260—455 B 13 Claims

1. A compound having the formula

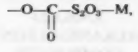


in which

X is selected from the group consisting of hydrogen and the grouping



R is selected from the group consisting of (1) straight and branched open chain saturated and unsaturated aliphatic hydrocarbon radicals having from 1 to 18 carbon atoms in which the branching occurs at a carbon atom not bonded directly to oxygen when X is hydrogen, (2) straight and branched open chain saturated and unsaturated aliphatic hydrocarbon radicals having from 2 to 18 carbon atoms in which the branching occurs at a carbon atom not bonded directly to oxygen when X is



(3) mono- and poly-oxaalkylene radicals having from one to five oxaalkylene groups in which each alkylene group contains from 2 to 10 carbon atoms and in which the total number of carbon and oxygen atoms is from 5 to 26, and (4) corresponding radicals in which at least one hydrogen atom is replaced by fluorine,

and M is selected from the group consisting of alkali metals and alkali earth metals.

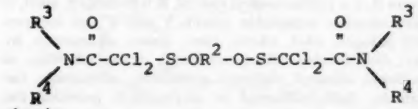
3,906,022

SUBSTITUTED DICHLOROMETHANE SULFENYL ESTERS AND THEIR MANUFACTURE

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 172,316, Aug. 16, 1971, Pat. No. 3,843,705. This application June 7, 1974, Ser. No. 477,391
Int. Cl.² C07C *145/00*
U.S. Cl. 260—456 A 4 Claims

1. A compound having the formula



wherein

R^2 is phenylene, lower alkyl phenylene or halophenylene, R^3 is lower alkyl or lower alkoxyalkyl and R^4 is phenyl, halophenyl, lower alkyl phenyl, lower alkyl or lower alkoxyalkyl.

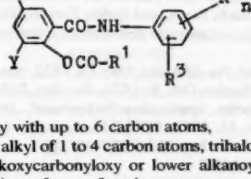
3,906,023

SUBSTITUTED-2-ALKOXYCARBONYLOXY BENZOIC ACID ANILIDES

Karl Heinz Buchel, Wuppertal-Elberfeld, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 20, 1972, Ser. No. 246,011
Claims priority, application Germany, Apr. 28, 1971, 2120862
Int. Cl.³ C07C *103/76, 103/78;* A01N *9/20*
U.S. Cl. 260—463 6 Claims

1. A 2-acyloxybenzoic acid of the formula:



(I)

in which

R^1 is alkoxy with up to 6 carbon atoms,

R^2 is lower alkyl of 1 to 4 carbon atoms, trihalomethyl, halo, lower alkoxycarbonyloxy or lower alkanoyloxy with an alkyl moiety of up to 3 carbon atoms,

R^3 is hydrogen, lower alkyl, trihalomethyl, lower alkoxy, lower alkylmercapto, halo, nitro or lower alkoxycarbonyloxy with up to 3 carbon atoms in any of the alkyl moieties,
n is 1, 2 or 3, and
X is hydrogen and Y is nitro, or
X is bromine or tertiary butyl and Y is chlorine or bromine, or
X is chlorine and Y is chlorine or bromine, or hydrogen with R^1 being alkoxy.

3,906,024
PERFLUOROALKANESULFONAMIDOARYL COMPOUNDS

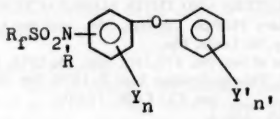
George G. I. Moore, Birchwood, and Joseph Kenneth Harrington, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 118,476, Feb. 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 28,148, April 13, 1970, abandoned. This application July 3, 1972, Ser. No. 268,605The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

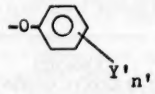
Int. Cl. C07c *143/74*

U.S. Cl. 260—465 E **17 Claims**

1. A compound of the formula



wherein R_f is a perfluoroalkyl radical, R is hydrogen, alkyl, or a horticulturally acceptable cation, Y and Y′ are independently halogen, alkyl, alkoxy, nitro, amino, alkanamido, hydroxy, dialkylamino, alkoxycarbamoyl, cyano, alkylthio, alkylsulfonyl, alkanoyl, carboxyl, carbalkoxy, alkylamino, carboxamido, dialkylsulfamoyl or alkylsulfinyl, provided that when Y is in the 4 or 5 position with respect to the $—NRSO_2R_f$ group and the group



is in the 2 position with respect to the $—NRSO_2R_f$ group, Y is not nitro, amino, alkanamido, dialkylamino or alkoxycarbamoyl, and n and n' are independently 0–2 provided that the individual aliphatic groups appearing in R_f, R, Y and Y′ contain from one to four carbon atoms each.

3,906,025
(2-AMINOBENZOPHENONE) ACETONITRILES

Joseph Hellerbach, Basel, and Guido Zanetti, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

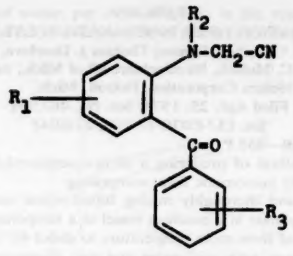
Division of Ser. No. 253,604, May 15, 1972, abandoned. This application Oct. 8, 1974, Ser. No. 513,024

Claims priority, application Switzerland, June 22, 1971, 9106/71; Apr. 11, 1972, 5287/72

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **3 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, halogen or trifluoromethyl; R_2 signifies hydrogen or lower alkyl; and R_3 signifies hydrogen or halogen.

3,906,026
PROCESS FOR PREPARING ALKYL TRANS-CHRYSANTHEMATE

Tsuneyuki Nagase, Takatsuki; Gohu Suzukamo, Ibaragi; Yukio Yoneyshi, Takatsuki, and Hirosuke Yoshioka, Ikeda, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed May 10, 1973, Ser. No. 358,988

Claims priority, application Japan, May 16, 1972, 47-48852; May 18, 1972, 47-49695; June 5, 1972, 47-56258; Mar. 1, 1973, 48-25472

Int. Cl.² C07C *67/30*

U.S. Cl. 260—468 H **11 Claims**

1. A process for preparing an alkyl trans-chrysanthemate which comprises treating the corresponding cis-isomer with a catalyst selected from the group consisting of (1) an alkali metal catalyst, (2) an alkaline catalyst composition prepared by heating alumina, an alkali metal hydroxide in an amount of from about 1/200 to 1 part by weight with respect to one part by weight of the alumina and an alkali metal in an amount of from about 1/50 to 1/5 part by weight with respect to one part by weight of the alumina at a temperature higher than the melting point of the alkali metal and (3) an alkali metal hydride catalyst in an amount of from about 1/1000 to ½ mol of catalyst, based on the alkali metal, per 1 mol of the starting cis-isomer at a temperature of from about 50° to 200°C.

3,906,027
N-(PERFLUOROALKYL-SULPHONYL)-CARBAMIC ACID ESTERS OF POLYALKYLENE OXIDES

Johann Nikolaus Meussdoerffer, Blecher; Hans Niederprüm, Monheim, Rhineland, and Manfred Dahm, Bergisch-Neukirchen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

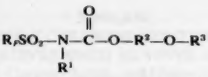
Filed July 20, 1973, Ser. No. 381,313

Claims priority, application Germany, Aug. 5, 1972, 2238740

Int. Cl.² C07C *143/78, 143/77, 143/75, 143/74*

U.S. Cl. 260—468 E **3 Claims**

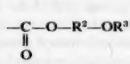
1. N—(Perfluoroalkyl—sulphonyl)—carbamic acid esters of polyalkylene glycols of the formula



in which:

R_f is perfluoroalkyl of up to 20 carbon atoms,

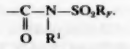
R^1 is hydrogen or alkyl of up to about 18 carbon atoms, hydroxy-alkyl of up to about 4 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, alkenyl of up to about 4 carbon atoms, phenyl-substituted alkyl of up to about 4 carbon atoms or alkoxy-lower alkyl of up to about 4 carbon atoms in each alkyl radical, or



R^2 is a polyoxyalkylene radical made up of the structural units $(-CH_2-CH_2-O)_n$ and $(-CH_2-CHCH_3-O)_m$,

m and n are from 0 to about 200 but are not both simultaneously 0, and

R^3 is alkyl of up to 8 carbon atoms, alkenyl of up to about 4 carbon atoms, phenyl-substituted lower alkyl of up to about 4 carbon atoms, or



3,906,028
2-HALO-1-[ALKYL-1-(ALKYLAMINO) ETHYL] VINYL ALKANOIC ESTERS AND DERIVATIVES

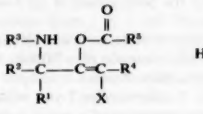
Nelson R. Easton, and William W. Hargrove, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 321,426, Jan. 1, 1973, Pat. No. 3,839,415, which is a division of Ser. No. 827,043, May 22, 1969, which is a continuation-in-part of Ser. No. 502,359, Oct. 22, 1965, abandoned. This application June 3, 1974, Ser. No. 475,722

Int. Cl.² C07C *93/227*

U.S. Cl. 260—468 R **1 Claim**

1. A compound of the formula



wherein

R^1 and R^2, when taken separately, are C_1–C_5 alkyl, C_5–C_6 cycloalkyl, or phenyl;

R^1 and R^2, when taken together with the carbon atom to which they are attached, represent C_5–C_6 cycloalkyl;

R^3 is hydrogen, C_1–C_5 alkyl, C_4–C_8 cycloalkyl, phenyl, or phenyl-substituted C_1–C_3 alkyl;

R^4 is hydrogen or C_1–C_3 alkyl;

R^5 is hydrogen, C_1–C_5 alkyl, or C_5–C_6 cycloalkyl; and

X is bromine, chlorine, or iodine.

3,906,029
N,N'-BIS(P-PHENOXYCARBOPHENYL)SULFONDIAMIDE

Reginoldus Havinga, Schalkhaar, and Pieter Dirk Swaters, Lochem, both of Netherlands, assignors to Koninklijke Industrieele Maatschappij Noury & Van der Lande N.V., Deventer, Netherlands

Division of Ser. No. 67,588, Aug. 27, 1970, Pat. No. 3,809,707. This application July 6, 1973, Ser. No. 377,095

Claims priority, application Netherlands, Aug. 28, 1969, 6913138

Int. Cl. C07c *161/00*

U.S. Cl. 260—470 **1 Claim**

1. The compound N,N'-bis(p-phenoxycarbophenyl sulfondiamide.

3,906,030
AMINO ETHER DERIVATIVES OF ORTHOTHYMOTIC ESTERS

Albert Rene Castaigne, Toulouse, France, assignor to Centre d'Etudes pour l'Industrie Pharmaceutique, Toulouse, France

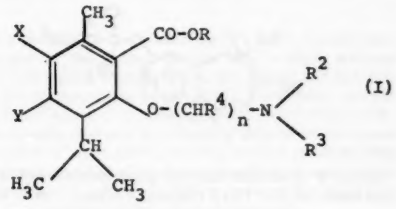
Filed July 5, 1973, Ser. No. 376,906

Claims priority, application France, July 20, 1972, 72.26158

Int. Cl.² C07C *101/42*

U.S. Cl. 260—471 R **8 Claims**

1. A compound selected from the amino ether derivatives of ortho-thymotic esters of the formula:



(I)

in which R is selected from the lower alkyl radicals having 1–4 carbon atoms; R^2 and R^3 are individually selected from hydrogen and the lower alkyl radicals having 1–6 carbon atoms; n is an integer from 1 to 4; R^4 considered individually in each radical —(CHR^4)— is selected from hydrogen and the lower alkyl radicals having 1–6 carbon atoms; and X and Y are each selected from hydrogen and nitro; and their pharmaceutically acceptable acid addition salts.

3,906,031
NOVEL 9-FLUORENYLMETHOXYCARBONYL COMPOUNDS

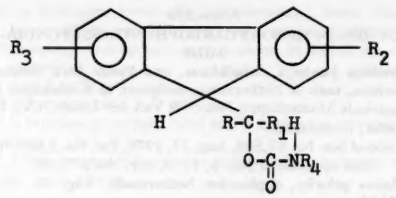
Louis A. Carpino, and Grace Y. Han, both of Amherst, Mass., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 124,479, March 15, 1971, Pat. No. 3,835,175. This application Aug. 17, 1973, Ser. No. 389,225

Int. Cl.² C07C *125/06*

U.S. Cl. 260—471 C **2 Claims**

1. A protected amino acid of the formula



wherein each of R and R_1 are hydrogen, alkyl or aryl containing up to about eight carbon atoms; each of R_2 and R_3 are hydrogen, fluorine, chlorine, bromine, iodine or nitro, and R_4 is an aromatic amino acid residue.

3,906,032

DIHYDROXY-TETRAHYDRONAPHTHYOX-YISOBUTYRIC ACIDS AND ALKYL ESTERS AND SALTS THEREOF

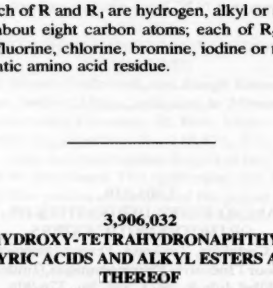
Frederic Peter Hauck, Somerville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 10, 1972, Ser. No. 305,619

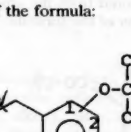
Int. Cl. C07c *69/76*

U.S. Cl. 260—473 F **5 Claims**

1. A compound of the formula:



wherein R^1 is selected from the group consisting of hydrogen and lower alkyl of 1 to 8 carbons, n is zero, 1 or 2; the



side chain is in either the 1 or 2 position; and the pharmaceutically acceptable salts thereof.

3,906,033

OXALIC ACID DIARYLAMIDES

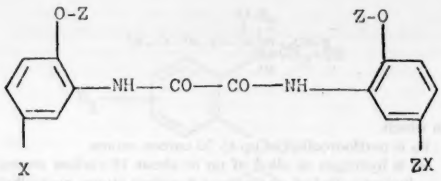
Hans Rudolf Biland, Basel; Max Duennenberger, Frenkendorf, and Christian Luethi, Muenchenstein, all of Switzerland, assignors to Ciba-Geigy A.G., Basel, Switzerland

Continuation-in-part of Ser. No. 879,964, Dec. 4, 1969, abandoned, which is a division of Ser. No. 599,363, Dec. 6, 1966, Pat. No. 3,542,573. This application Dec. 18, 1972, Ser. No. 316,304

Int. Cl.² C07C *103/30*

U.S. Cl. 260—479 R **9 Claims**

1. A symmetrical oxalic acid diarylamide of the formula



in which Z represents a member selected from the group consisting of an alkyl group with 1 to 18 carbon atoms, an acetyl, butyryl, lauroyl, octadecanoyl, benzoyl, para-tertiary butylbenzoyl or para-chlorobenzoyl group, a benzyl group, an allyl group, and a mono-halogenalkyl group with up to 8 carbon atoms, and X represents a member selected from the group consisting of an alkyl group with up to 12 carbon atoms, a halogen atom, a phenyl and cyclohexyl group.

3,906,034

TRIFLUOROMETHYL-SALICYLANILIDES

Raimund Franz, and Dieter Duwel, both of Hofheim, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 15, 1973, Ser. No. 341,559

Claims priority, application Germany, Mar. 21, 1972, 2213607

Int. Cl.² C07C *103/76*

U.S. Cl. 260—479 R **12 Claims**

1. 4-Trifluoromethyl-5-nitro-4'-chloro-salicylanilide.

3,906,035

PROCESS FOR THE PREPARATION OF CIS-8-DODECEN-1-OL ACETATE

George Holan, Brighton, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jan. 29, 1974, Ser. No. 437,694

Claims priority, application Australia, Jan. 30, 1973, 2069/73

Int. Cl.² C07C *67/28*

U.S. Cl. 260—491 **2 Claims**

1. A process for the preparation of cis-8-dodecen-1-ol acetate comprising:

a. reacting 1-chloro-6-iodo-hexane with pent-1-yne in liquid ammonia in the presence of a lithium amide catalyst to form -1-chloroundec-7-yne.

b. reacting the 1-chloroundec-7-yne with an alkali metal cyanide in the presence of a metal iodide as catalyst to form 1-cyanoundec-7-yne

c. subjecting the 1-cyanoundec-7-yne to alkaline hydrolysis to form 8-dodecynoic acid

d. reducing the 8-dodecynoic acid with sodium bis(methoxyethoxy) aluminium hydride to form 8-dodecyn-1-ol

e. acetylating the 8-dodecyn-1-ol to form 8-dodecyn-1-ol acetate, and

f. stereospecifically reducing the 8-dodecyn-1-ol acetate with bis(sec-isoamyl)-borane to form cis-8-dodecen-1-ol acetate.

3,906,036

REDUCTION OF CHLORIDE CONTENT IN OLEFIN DERIVATIVES SUCH AS VINYL ACETATE

Jerald E. Dirks, Corpus Christi, and Glenn E. Organ, Bay City, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 25, 1968, Ser. No. 715,511
Int. Cl.² C07C 67/05
U.S. Cl. 260—497 R 10 Claims

1. In a process for producing vinyl acetate by contacting ethylene and a gas comprising molecular oxygen, in an olefin reaction zone, with an essentially non-aqueous liquid reaction medium comprising acetic acid containing a noble metal ion catalyst, an alkali metal acetate and a redox agent comprising a copper (II) salt, in which process at least a portion of said copper (II) salt is converted to copper (II) oxalate and in which process the catalyst is regenerated by a process comprising withdrawing a portion of said liquid reaction medium containing copper (II) oxalate from said olefin reaction zone, treating said portion of liquid reaction medium with hydrochloric acid and heating whereby the copper (II) oxalate content of said portion of liquid reaction medium is converted to (a) soluble copper salts and (b) decomposition products of oxalic acid, the improvement which comprises:

a. after said treatment with hydrochloric acid and heating, separating said portion of liquid reaction medium, by a vaporization process at a temperature below 170°C, into a light ends fraction comprising chloroform and a stripped residue substantially free from chloroform, and b. recycling said stipped residue to said olefin reaction zone,

whereby chloroform and related volatile organic chlorides formed in said catalyst regeneration process are kept from contaminating said vinyl acetate.

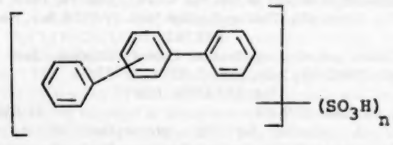
3,906,037

FORMALDEHYDE CONDENSATION PRODUCTS OF TERPHENYL-SULPHONIC ACIDS

Franz Schade, Cologne-Buchheim, and Reinhard Nebeling, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 24, 1969, Ser. No. 869,373
Claims priority, application Germany, Nov. 2, 1968, 1806536
Int. Cl. C07c 143/24
U.S. Cl. 260—505 C 4 Claims

1. A condensation product obtained by condensing (1) a mixture of terphenyl-sulfonic acids having the formula



wherein *n* is a number from 1 to 4 and obtained by heating a mixture of 1–5 moles sulfuric acid monohydrate per mol of terphenyl at 60°–180°C, with (2) 0.4–1.0 mol formaldehyde per mol of said terphenyl-sulfonic acid at a temperature of 80°–140°C.

3,906,038

2-(6-SULFO-2-NAPHTHYL)PROPIONIC ACID

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Filed Jan. 17, 1973, Ser. No. 324,507
Division of Ser. No. 862,490, Sept. 30, 1969, abandoned.
This application Jan. 17, 1973, Ser. No. 324,507
Int. Cl.² C07C 143/52
U.S. Cl. 260—507 R 1 Claim

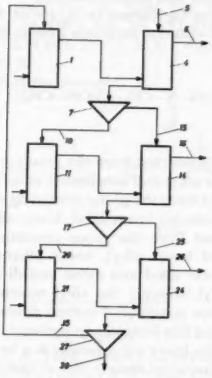
1. 2-(6-sulfo-2-naphthyl)propionic acid.

3,906,039

RECOVERY OF SULFUR DIOXIDE FROM SULFURIC ACID CONTAINING FERROUS SULFATE

Herbert Furkert, Grosskonigsdorf, Germany, assignor to Chemiebau Dr. A. Zieren GmbH & Co. KG, Mungersdorf, Germany

Filed Mar. 6, 1973, Ser. No. 338,416
Claims priority, application Germany, Mar. 6, 1972, 2210637
Int. Cl.² C01B 17/50
U.S. Cl. 423—540 7 Claims



1. In a process for the production of a sulfur-dioxide-containing gas for the contact process from a dilute aqueous sulfuric acid stream containing iron (II) sulfate and approximately 10–40 percent by weight H_2SO_4, comprising concentrating the acid in an evaporation stage, and reductively cracking the concentrated acid in a cracking stage at temperatures of between 850° and 1,100° C. to a hot cracked gas containing SO_2 said concentrated acid being sprayed through nozzles into a reactor for said reductive cracking, said reactor being traversed by a turbulent stream of combustion gas,

the improvement comprising evaporating the 10–40 percent strength sulfuric acid to 55–70 percent strength sulfuric acid by direct heat exchange with the hot cracked gas; simultaneously forming precipitate containing iron (II) sulfate separating the precipitate from resultant concentrated acid, cracking said precipitate at 850°–1,100° C in a zone separate from where the resultant concentrated sulfuric acid is cracked, separating a portion of metallic oxides formed during the cracking of said precipitate to hot cracked gas, employing resultant hot cracked gas for evaporation purposes; and passing the resultant concentrated sulfuric acid to the cracking stage and employing resultant hot cracked gas also for evaporation purposes.

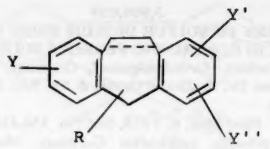
3,906,040

DIBENZOCYCLOHEPTENES SUBSTITUTED

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Lauble, Vaucresson, all of France, assignors to Science Union et Cie, Society Francaise de Recherche Medicale, Suresnes, France

Filed Jan. 24, 1973, Ser. No. 326,362
Claims priority, application United Kingdom, Jan. 24, 1972, 3237/72
Int. Cl.² C07C 103/78
U.S. Cl. 260—558 R 14 Claims

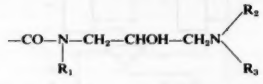
1. A dibenzo cycloheptene of the formula



wherein:

Y, Y' and Y'' are selected from the group consisting of hydrogen, halogen, lower alkyl, substituted lower alkyl, lower alkoxy and trifluoromethyl;

R, attached to the carbon in 5-, 10- or 11-position, represents a 1,3-diamino propanol-2 chain having the formula:



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl and substituted lower alkyl,

R_2 is selected from the group consisting of hydrogen, lower alkyl, substituted lower alkyl, lower alkenyl and benzyl,

R_3 is selected from the group consisting of lower alkyl, substituted lower alkyl, lower alkenyl, lower alkynyl, phenyl lower alkyl and mono and di substituted phenyl lower alkyl, wherein the alkyl moieties of acid phenyl alkyl groups possess 1–4 carbon atoms,

and the dotted line indicates an optional 10–11 double bond wherein the lower alkyl moiety is a branched or straight chain hydrocarbyl moiety of 1–6 carbon atoms,

the substituents on the substituted lower alkyl moiety are an hydroxy, a lower alkoxy and a di-lower alkyl amino, wherein said lower alkoxy and lower alkyl moieties contain 1–6 carbon atoms,

the substituents on said substituted phenyl moiety are methoxy, trifluoromethyl and chloro,

and their acid addition salt with a therapeutically compatible mineral or organic acid.

3,906,041

OXALIC ACID DERIVATIVES

Kurt Hofer, Munchenstein; Rudolf Moesch, Stein; Alfred Schilli, Reinach, all of Switzerland, and Evelyne Burdet, Mulhouse, France, assignors to Sandoz Ltd., Basel, Switzerland

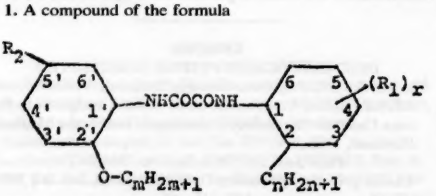
Continuation-in-part of Ser. Nos. 170,660, Aug. 10, 1971, Pat. No. 3,808,273, and Ser. No. 808,041, March 12, 1969, abandoned, said Ser. No. 808,041, is a continuation-in-part of Ser. No. 799,898, Feb. 17, 1969, abandoned. This application Sept. 7, 1973, Ser. No. 405,331

Claims priority, application Switzerland, Feb. 19, 1968, 2371/68; Mar. 12, 1968, 3641/68; Aug. 13, 1970, 12173/71

Int. Cl.² C07C *103/30*

U.S. Cl. 260—558 S **52 Claims**

1. A compound of the formula



wherein *m* represents a whole number from 1 to 8 inclusive, *n* represents a whole number from 1 to 4 inclusive, *r* represents the number 1 or 2, R_1 represents a hydrogen atom or an alkyl radical containing from one to four carbon atoms in at least one of the positions 4 or 5 of the ring, and R_2 represents a hydrogen atom or an alkyl radical containing from one to eight carbon atoms.

3,906,042

MULTIFUNCTIONAL HYDROXY COMPOUNDS

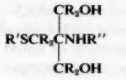
Clarence R. Bresson, and Raymond L. Cobb, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 136,603, April 22, 1971, Pat. No. 3,789,069, which is a division of Ser. No. 749,990, Aug. 5, 1968, Pat. No. 3,609,189, which is a division of Ser. No. 492,892, Oct. 4, 1965, Pat. No. 3,414,617. This application Oct. 4, 1973, Ser. No. 403,458

Int. Cl.² C07C *103/16*

U.S. Cl. 260—559 T **22 Claims**

1. A compound selected from the group consisting of compounds having the formula:



wherein each R is individually selected from the group consisting of hydrogen and alkyl radicals containing from 1 to 3 carbon atoms; R' is selected from the group consisting of hydrogen and a monovalent hydrocarbyl radical containing up to 12 carbon atoms, said monovalent hydrocarbyl radical being selected from the group consisting of alkyl, cycloalkyl, phenyl, phenylalkyl, alkylphenyl and alkylphenylmethyl; R'' is a carbamoyl substituted hydrocarbyl radical containing up to 12 carbon atoms, the hydrocarbyl radical which is carbamoyl substituted being selected from the group consisting of alkyl, cycloalkyl, phenylalkyl, alkylcycloalkyl, and alkylphenylalkyl; said hydrocarbyl radical which is carbamoyl substituted being cycloalkyl, phenylalkyl, alkylcycloalkyl or alkylphenylalkyl when R' is hydrogen or alkyl; said compound containing up to a totol of 36 carbon atoms.

3,906,043

WATER-SOLUBLE TETRACYCLINES

Israel Marcus, 52 Bansstraat, Amsterdam, Netherlands

Continuation-in-part of Ser. No. 45,267, June 10, 1970, Pat. No. 3,846,486. This application Sept. 6, 1974, Ser. No. 503,762

Claims priority, application United Kingdom, June 12, 1969, 29968/69; Italy, June 7, 1974, 23737/74

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 AT **11 Claims**

1. A process for the preparation of a methyleneaminosalicylate/tetracycline complex by the reaction of a methyleneaminosalicylate with a tetracycline in a solvent selected from the group consisting of 1,2-dimethoxyethane, methyl ethyl ketone, and mixtures thereof.

3,906,044

ADAMANTYLAMIDINES AND PROCESSES FOR MAKING THEM

Koji Aigami, and Yoshiaki Inamoto, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

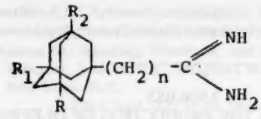
Filed Oct. 16, 1974, Ser. No. 515,429

Claims priority, application Japan, Oct. 19, 1973, 48-117457

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 R **4 Claims**

1. A compound having the formula



(II)

wherein R, R_1 and R_2, which are the same or different, are hydrogen or alkyl of one to 4 carbon atoms, and *n* is 0 or 1; or a salt thereof with a pharmaceutically acceptable acid.

3,906,045

HOMOGENEOUS RUTHENIUM CATALYSTS USEFUL IN THE SELECTIVE REDUCTION OF NITROAROMATICS TO AMINES

John F. Knifton, Poughquag, and Robert M. Suggitt, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 121,132, March 4, 1971, Pat. No. 3,832,401, and a continuation-in-part of Ser. No. 193,204, Oct. 27, 1971, abandoned. This application Apr. 22, 1974, Ser. No. 462,833

Int. Cl. C07c *85/11*

U.S. Cl. 260—580 17 Claims

1. A process for selectively and sequentially hydrogenating the nitro group of a mononitroaromatic substrate contained in a two component nitroaromatic substrate mixture consisting essentially of one mononitroaromatic substrate and one mononitro ortho-substituted polyalkylaromatic substrate, said process consisting essentially of:

1. admixing one mononitroaromatic substrates selected from the group consisting of nitrobenzene, p-nitrotoluene, m-nitrotoluene, p-nitroethylbenzene, 1,2-dimethyl-4-nitrobenzene, 1,2-dimethyl-3-nitrobenzene, 1,4-dimethyl-2-nitrobenzene, 1,3-dimethyl-4-nitrobenzene, 1,3-dimethyl-5-nitrobenzene-1-nitronaphthalene, 2-nitronaphthalene, 4-nitrobiphenyl and 9-nitroanthracene, with one mononitro ortho substituted polyalkylaromatic substrate selected from the group consisting of 2-nitromesitylene, nitrodurene, 1,3-dimethyl-2-nitrobenzene and 1,3-diethyl-2-nitrobenzene in the presence of inert, non-aqueous, non-oxidizing solvent environment, with at least a catalytic quantity of a homogeneous, solubilized ruthenium catalyst selected from the group consisting of $RuCl_2[P(C_6H_5)_3]_3$, $[Ru(CO)_3Cl_2]_2$, $RuCl_2.(CO)_2[P(C_6H_5)_3]_2$, $RuCl_3[As(C_6H_5)_3]_2$, $RuCl_2[Sb(C_6H_5)_3]_3$, $RuCl_2[P(p\text{-}CH_3.C_6H_4)_3]_3$, $RuClH[P(C_6H_5)_3]_3$ and $RuCl_2[P(CH_3)_2C_6H_5]_3$ to form a reaction mixture, and

2. heating said reaction mixture between about 50°C to about 135°C with at least sufficient hydrogen gas to hydrogenate the nitro group of the one mononitroaromatic said hydrogen gas being supplied at superatmospheric pressure ranging from about 100 psig to about 2000 psig and continuing heating the pressurized reaction mixture until from about 80% to 95% of said nitro group of the mononitroaromatic is converted to the corresponding amine.

3,906,046

PROCESS FOR THE PRODUCTION OF 2-AMINO-1-BUTANOL

Hiroshi Yoshida, Fujisawa; Kazuyoshi Sasai, Tokyo, and Teruo Kubomatsu, Osaka, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan

Filed Jan. 2, 1974, Ser. No. 430,042

Int. Cl.² C07C *91/02, 93/02, 93/10, 95/02*

U.S. Cl. 260—584 R 9 Claims

1. A process for the production of 2-amino-1-butanol which comprises reducing an ester of α-aminobutyric acid with hydrogen in an organic solvent in the presence of a copper chromite catalyst containing $CuO.CuCr_2O_4$ as the principal constituent which is subjected to a reduction reaction with hydrogen in advance of said reduction.

3,906,047

8-(2,6,6-TRIMETHYL-4-OXO-2-CYCLOHEXEN-1-YLIDENE-2-METHYLENE-6-METHYL-4,6-OCTADIEN-3-OL

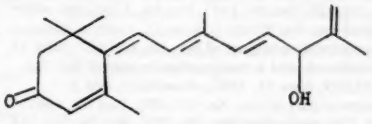
Joseph Donald Surmatis, and Armin Walser, both of West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 153,090, June 14, 1971, Pat. No. 3,830,844, which is a division of Ser. No. 826,022, May 19, 1969, Pat. No. 3,624,105, which is a division of Ser. No. 617,827, Feb. 23, 1967, Pat. No. 3,466,331. This application May 20, 1974, Ser. No. 471,531

Int. Cl.² C07C *33/02, 33/05, 49/44*

U.S. Cl. 260—586 R 1 Claim

1. A compound of the formula:



(XIII)

3,906,048

SURFACE ACTIVE AGENT CONTAINING HYDROXYLATED ALKYLTHIO CHAINS

Guy Vanlerberghe, Commune de villevaude par Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

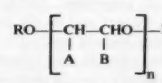
Continuation-in-part of Ser. No. 874,373, Nov. 5, 1969, abandoned. This application Sept. 12, 1972, Ser. No. 288,327

Claims priority, application Luxemburg, Nov. 5, 1968, 57246

Int. Cl.² C07C *121/14*

U.S. Cl. 260—609 R 3 Claims

1. A mixture of compounds of the formula



wherein R represents a member selected from the group consisting of alkyl containing 8–30 carbon atoms, alkenyl containing 8–18 carbon atoms, nonylphenyl, alkyl polyoxyalkylene containing 14–60 carbon atoms and 1–10 oxygen atoms and cycloaliphatic radical which is the residue of alcohols derived from the hydrogenation of lanolin, one of A and B represents hydrogen and the other a member selected from the group consisting of $—CH_2Z$, halomethyl and hydroxy with the proviso that at least 80% thereof be $—CH_2Z$ wherein Z is R'S— wherein R' is selected from the group consisting of alkyl, monohydroxyl alkyl and polyhydroxylalkyl, containing 1–4 carbon atoms and *n* ranges between 1 and about 20.

3,906,049

FLUORINE AND SULFUR-CONTAINING COMPOSITIONS

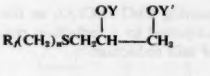
Robert Bonner Hager, Collegeville, and Sameeh Said Toukan, Phoenixville, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 283,886, Aug. 25, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,145

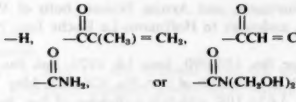
Int. Cl. C07c *149/18*

U.S. Cl. 260—609 R 5 Claims

1. A compound of the structure:



where R_f is selected from the group consisting of $CF_3(CF_2)_y$, $(CF_3)_2CF(CF_2)_y$ and $(CF_3)_2CFO(CF_2)_y$ where y is an integer of 1 to 14, n is 1–12, and Y and Y′ are independently



3,906,050

ALKYLIDENEDITHIOBISPHENOLS

Martin B. Neuworth, Trumbull, Conn., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 367,055, May 29, 1973, which is a division of Ser. No. 206,929, Dec. 10, 1971, Pat. No. 3,786,100, which is a division of Ser. No. 835,811, June 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 637,622, May 11, 1967, abandoned, and a continuation-in-part of Ser. No. 637,649, May 11, 1967, abandoned, and a continuation-in-part of Ser. No. 637,650, May 11, 1967, abandoned. This application Nov. 20, 1974, Ser. No. 525,331

Int. Cl.[2] C07C *149/36*

U.S. Cl. 260—609 F **2 Claims**

1. 2,4-Pentanedione:2,2-Bis-(3,5-di-t-butyl-4-hydroxyphenyl)-mercaptal-4,4-diethyl acetal.

3,906,051

ALKYL FLUORIDE PRODUCTION

Cecil O. Carter, Wann, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 29, 1973, Ser. No. 327,734

Int. Cl.[2] C07C *17/08, 19/08*

U.S. Cl. 260—653.6 **3 Claims**

1. In a process for the production of an alkylate wherein an isoparaffin selected from the group consisting of isobutane, isopentane and mixtures thereof and an olefin selected from the group consisting of propylene, butylene, isobutylene, amylenes and mixtures thereof and an HF catalyst are introduced into a reaction zone and are reacted to form an effluent comprising said alkylate, wherein said effluent is passed into a fractionation zone, wherein said alkylate is withdrawn as a liquid, and wherein a vapor comprising light hydrocarbons and HF is withdrawn from said fractionation zone,

the improvement which comprises

contacting said vapor from said fractionation zone with water at a pressure not greater than 300 psig and at a temperature of about 50° to about 150°F. to form a first mixture comprising HF and water, and reacting said first mixture with an olefin which comprises one of propylene, isobutylene, cis-butene-2, trans-butene-2, butene-1, amylenes or mixtures thereof in an olefin-to-HF weight ratio of 5:1 to 40:1 at a pressure not greater than 300 psig and at a temperature of about 50° to about 150°F. to form an alkyl fluoride.

3,906,052

DICHLOROFLUOROMETHYLCYCLOPROPANES

Robert S. Holdsworth, Arlington; Charles A. Billings, Concord, and Gerald J. O'Neill, Arlington, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 10, 1975, Ser. No. 539,985

Int. Cl.[2] C07C *23/04*

U.S. Cl. 260—648 F **1 Claim**

1. The dichloromethylcyclopropanes selected from the group consisting of 1,1-dichloro-2-methyl-2,3,3-trifluorocyclopropane and 1,2-dichloro-1-fluoro-2-methylcyclopropane.

3,906,053

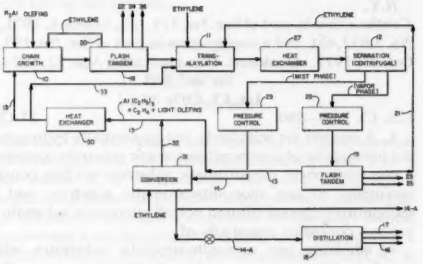
PROCESS FOR THE PRODUCTION OF OLEFINS

Carroll W. Lanier, Baker, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 170,580, Aug. 10, 1971, Pat. No. 3,789,081, which is a division of Ser. No. 853,306, Aug. 27, 1969, Pat. No. 3,663,647. This application Nov. 7, 1973, Ser. No. 413,561The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 D **7 Claims**



1. A process for producing olefins in the range of about 6 to about 20 carbon atoms per molecule which comprises:

a. feeding lower olefin and lower trialkyl aluminum compound and olefin falling in said range into a reaction system maintained under elevated temperature and pressure reaction conditions to generate a reaction effluent including olefin molecules falling in said range, olefin molecules falling outside of said range and higher trialkyl aluminum compound;

b. separately flashing from said effluent olefin below said range and product olefin within said range separable from the higher trialkyl aluminum compound;

c. feeding lower olefin and at least part of the residue remaining after the flashing of (b) into a reaction system maintained under elevated temperature and pressure conditions to displace alkyl groups of the higher trialkyl aluminum compound and form a displacement mixture containing olefin molecules falling in said range, olefin molecules falling outside of said range and lower trialkyl aluminum compound;

d. converting at least part of the displacement mixture to a mixed vapor-mist system in which C_{16} and higher olefins and higher trialkyl aluminum compound are in the mist phase and olefins up to about C_{14} and lower trialkyl aluminum compound are in the vapor phase;

e. feeding the mixed vapor-mist system into an inertia separator and separating the vapor phase and mist phase components into respective streams;

f. converting into lower trialkyl aluminum compound at least a portion of the higher trialkyl aluminum compound contained in the mist phase stream from (e) and separating from the olefin lower trialkyl aluminum compound thus produced; and

g. feeding to (a) at least part of the vapor phase component stream separated at (e).

3,906,054

ALKYLATION OF OLEFINS

Warren W. Kaeding, Westfield, and Stephen A. Butter, East Windsor, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,306
Int. Cl.² C07C 3/52
U.S. Cl. 260—683.43 35 Claims

1. A process for the alkylation of an olefin with an alkylating agent comprising contacting said olefin in the presence of said alkylating agent with a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index of about 1 to 12, and containing phosphorus incorporated with the crystal structure thereof in an amount of at least about 0.78 percent by weight.

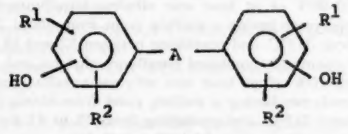
3,906,055

EPOXY RESIN WITH METAL SALT OF BISPHENOL OR NOVOLAC AS FIRE RESISTANT COMPOSITION

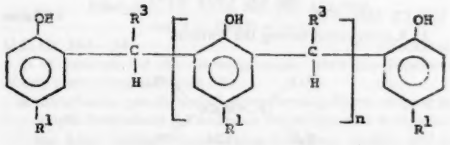
Norman Fishman, Menlo Park, and Dean B. Parkinson, Redwood City, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Sept. 10, 1973, Ser. No. 395,842
Int. Cl.² C08G 59/62; C08K 5/13; C08L 63/02
U.S. Cl. 260—831 6 Claims

1. An epoxy resin composition which may be cured to a resin having good fire resistance, said composition comprising an epoxy resin component formed by the reaction of epichlorohydrin with a dihydric phenol, together with from about 1 to 10 percent, based on the weight of said epoxy resin component, of a salt of a polyvalent metal selected from the group consisting of zinc, aluminum, ferric iron and titanic titanium with a phenolic compound selected from the group consisting of dihydric phenols and phenol-aldehyde resins, said phenolic compound being present in an amount which is at least about 50 percent above the amount theoretically required to satisfy all of the valencies of the said metal with hydroxy groups of the phenolic compound, whereby the said salt contains reactive phenolic hydroxy groups as well as salt linkages wherein the hydrogen of a phenolic hydroxy group is replaced by a valency of the said metal; the term "dihydric phenol" as employed herein referring to compounds having the structure:



wherein A represents oxygen, sulfur, a methylene group, a methylene group wherein one or both of the hydrogen atoms are replaced by C_1–C_3 alkyl groups, or a chemical bond, and wherein R^1 and R^2 represent hydrogen, chlorine, bromine, iodine or alkyl groups; and the term phenol-aldehyde resin as employed herein referring to compounds having the structure:



wherein R^1 has the same meaning as given above, R^3 is hydrogen or a C_1–C_3 alkyl group and n is a small number having an average value of from about 1 to 4.

3,906,056

COMPOSITION COMPRISING AN ETHYLENE-PROPYLENE RUBBER AND AN AMORPHORES ETHYLENE-PROPYLENE BLOCK COPOLYMER

Yasushi Okamoto, and Masayoshi Morimoto, both of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 16, 1973, Ser. No. 324,233
Claims priority, application Japan, Jan. 19, 1972, 47-7833
Int. Cl.² C08L 51/00, 53/00
U.S. Cl. 260—876 B 8 Claims

1. A composition having an improved processability, which consists essentially of a physical mixture of

97 to 70% by weight of an ethylene-propylene rubber selected from the group consisting of a copolymer of ethylene and propylene and an interpolymer of ethylene, propylene and at least one non-conjugated diene, the weight ratio of ethylene to propylene in said rubber ranging from 90:10 to 20:80, and

3 to 30% by weight of an ethylene-propylene block copolymer, said block copolymer being free from crystalline portion and having 1 to 30 ethylene-propylene bonded units, an intrinsic viscosity of 1.5 to 3.5 dl/g as measured in o-dichlorobenzene at 110°C and a propylene content of 20 to 80% by weight.

3,906,057

COMPATIBLE POLYMER ALLOYS

Richard R. Durst, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 282,484, Aug. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 207,612, Dec. 13, 1971, abandoned, which is a continuation-n-part of Ser. No. 5,369, Jan. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,049, Feb. 27, 1969, abandoned. This application Apr. 29, 1974, Ser. No. 464,903
Int. Cl.² C08L 53/02, 25/06, 25/10
U.S. Cl. 260—876 B 20 Claims

1. A blend consisting essentially of

A. a matrix of polymers prepared from at least 90 weight percent vinyl aryl monomers, any other monomers being other copolymerized ethylenically unsaturated monomers, said polymers having a number average molecular weight of from about 50,000 to 500,000;

B. non-crosslinked conjugated aliphatic diene polymers prepared from at least 60 weight percent 1,3-butadiene, 0 to 40 weight percent of copolymerized monovinyl-substituted monocyclic aryl compounds and 0 to 10 weight percent of other copolymerized ethylenically unsaturated monomers, the number average molecular weight of said polymers being at least 100,000; and

C. graded block copolymers of the type ABA in which each A segment is a polymer segment compatible with and essentially as defined above for component (A) and each B segment is a polymer segment compatible with and essentially as defined above for component (B), the weight ratio of total A to B ranging from 45:55 to 60:40, the number average molecular weight of said block copolymers being from 150,000 to 500,000, said graded block copolymers having a principal glass transition temperature of about −90°C. ± 5°C.;

components (B) and (C) being dispersed as a discontinuous phase in said component (A) as particles of which at least 70 weight percent have diameters in the range of 0.2 to 5 microns, components (A) and (B) being present in a molar ratio of at least about 1:1, and component (C) being present in the blend in an amount of from about 3 to 25 weight percent of the total blend, the total monovinyl monocyclic aryl units in components (A), (B) and (C) being from 75 to 95 weight percent of the total units in said components.

3,906,058

HIGH IMPACT TWO-COMPONENT RESIN BLENDS

Richard R. Durst, Stow, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 229,180, Feb. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 167,840, July 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,272, Dec. 17, 1970, abandoned. This application Apr. 29, 1974, Ser. No. 464,902

Int. Cl.[2] C08L *53/02, 25/06*

U.S. Cl. 260—876 B 16 Claims

1. A composition characterized by exhibiting excellent properties such as impact strength at low temperatures as well as room temperatures, said composition consisting essentially of a blend of

A. a matrix of polymers prepared from at least 90 weight percent monovinyl substituted monocyclic aryl monomers, any other monomers being other ethylenically unsaturated monomers, said polymers having a number average molecular weight of from about 50,000 to 500,000; and

B. graded block copolymers of the type ABA in which each A segment represents essentially polymerized styrene, the balance of said segment being polymerized butadiene and each B segment represents essentially polymerized butadiene, the balance of said segment being polymerized styrene, the weight ratio of total A to B ranging from 50:50 to 35:65, the number average molecular weight of said block copolymers being from 150,000 to 500,000, said graded block copolymers having a principal glass transition temperature of about −90°C. ± 5°C.;

component (A) being present in an amount greater than 50 weight percent but no greater than 90 weight percent of said blend and component (B) being present in an amount less than 50 weight percent but at least 10 weight percent of said blend, component (B) being dispersed in component (A) as particles of which at least 70 weight percent have diameters in the range of 0.2 to 5 microns, and the total monovinyl monocyclic aryl units in components (A) and (B) being from 75 to 94 weight percent of the total units in said components.

3,906,059

PROCESS FOR PREPARING VINYL CHLORIDE POLYMER COMPOSITION HAVING IMPROVED IMPACT STRENGTH AND PROCESSABILITY

Seiichiro Oba; Akira Tabuse, both of Tokuyama, and Koji Yasumoto, Hofu, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

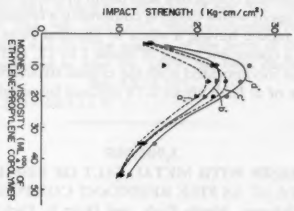
Filed July 23, 1973, Ser. No. 381,565

Claims priority, application Japan, July 26, 1972, 47-74107; Jan. 22, 1973, 48-8531

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R 9 Claims

1. A process for preparing a vinyl chloride polymer composition having improved impact strength and processability which comprises dissolving 1 to 15% by weight based on the resulting vinyl chloride polymer composition of an ethylene/propylene copolymer containing 0 to 0.5 mol % of an unsaturated unit and having a Mooney viscosity of 3 to 29 in a monomeric mixture consisting of 99.5 to 95.0% by weight of a vinyl



chloride and 0.5 to 5% by weight of an olefin having 2 to 8 carbon atoms, and polymerizing the monomeric mixture.

3,906,060

COATING COMPOSTIONS FOR METAL SUBSTRATES BASED ON ETHYLENETETRAFLUOROETHYLENE COPOLYMERS

Andrea Mattiussi, and Mario Modena, both of Bollate, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed June 25, 1973, Ser. No. 373,163

Claims priority, application Italy, June 28, 1972, 26325/72

Int. Cl. C08f *29/22*

U.S. Cl. 260—897 C 9 Claims

1. A coating composition comprising an ethylenetetrafluoroethylene copolymer mixture and at least one latent solvent, said ethylene-tetrafluoroethylene copolymer mixture being constituted by

a. 10–90% of at least one ethylene-tetrafluoroethylene copolymer having a melting point from about 250° to about 315°C. and containing between 52 and 58 mol % of chemically combined tetrafluoroethylene, and

b. 90–10% of at least one ethylene-tetrafluoroethylene copolymer having a melting point from about 180° to about 285°C. and containing from 35 to 45 mol % of chemically combined tetrafluoroethylene.

3,906,061

HALOGEN CONTAINING PHOSPHORUS MONOOLS

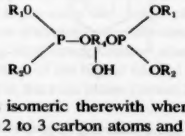
Nicodemus E. Boyer, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 55,575, July 16, 1970, Pat. No. 3,758,646. This application May 15, 1973, Ser. No. 360,474

Int. Cl.[2] C07F *9/141*

U.S. Cl. 260—928 4 Claims

1. A compound having the formula



or phosphonates isomeric therewith wherein R_1 and R_2 are haloalkyl having 2 to 3 carbon atoms and R_4 is alkylene of 3 to 6 carbon atoms, the halogens having an atomic weight up to 80.

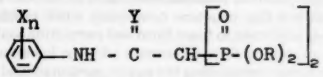
3,906,062

ALPHA,ALPHA-DIPHOSPHONATO ACETANILIDES

William I. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 9, 1974, Ser. No. 495,959
Int. Cl.[2] C07F 9/40
U.S. Cl. 260—932 6 Claims

1. Compounds of the formula



wherein:

X is halogen, CN, NO_2, NH_2 or a mineral acid salt thereof;
n is an integer from 0–5;
Y is oxygen or sulfur and
R's are alkyl groups having from 1–10 carbon atoms.

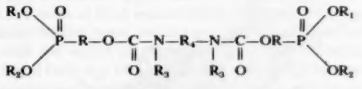
3,906,063

DIPHOSPHONATE ESTERS HAVING DICARBAMIC ACID DIESTERS

Udo-Winfried Hendricks, Cologne, and Klaus Walz, Berg. Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 17, 1974, Ser. No. 470,825
Claims priority, application Germany, May 19, 1973, 2325576
Int. Cl.[2] C07F 9/40, 9/38; D06C 27/00
U.S. Cl. 260—932 5 Claims

1. Dicarbamic acid diesters of the formula



in which

R represents a C_1–C_4-alkylene radical which is optionally substituted by one or more halogen atoms,
R_1 and R_2 independently of one another represent a C_1–C_4-alkyl radical which is optionally substituted by halogen atoms or together with the oxygen atoms and the phosphorus atom form a 5-membered to b 7-membered heterocyclic structure,
R_3 represents hydrogen or a hydroxymethyl or C_1–C_4-alkoxymethyl group and
R_4 represents a —CH(OH)—CH(OH)— or a —CH(R_5)— group,

in which

R_5 is hydrogen, an optionally halogen-substituted C_1–C_6-alkyl group or aryl group, a carboxyl group or a C_1–C_4-alkoxycarbonyl group.

3,906,064

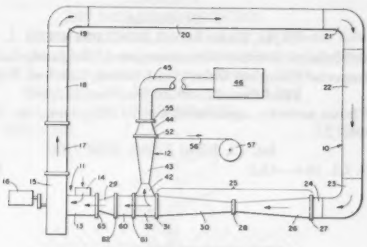
PROCESS FOR DRY FORMING PAPER

Fred D. Iannazzi, Andover; John W. Rafferty, Topsfield; Donald B. Sparrow, and Richard Strauss, both of Lexington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Feb. 12, 1973, Ser. No. 331,589
Int. Cl.[2] B01D 47/00
U.S. Cl. 264—24 15 Claims

1. A process for dry forming paper from gas-dispersed fibers, comprising the steps of

a. introducing gas-dispersed paper forming fibers, ranging in length from about 0.1 to about 1.5 inches, into a circulating loop having a converging-diverging section and a converging choke section, there being at least 130 cubic feet of said gas to one pound of said fibers;
b. circulating said gas-dispersed fibers in said loop, the gas flow rate within said loop ranging between about 500 and about 2000 feet per minute;
c. withdrawing downstream from said converging-diverging section and upstream from said choke section a portion of the circulating fibers; and



d. directing the fibers withdrawn from said loop against a papermaking wire to deposit them thereon to form paper; the rate at which said gas-dispersed fibers are circulated in said loop being at least twice the rate at which they are introduced into and withdrawn from said loop.

3,906,065

PROCESS FOR THE PRODUCTION OF SHAPED, MARBLED THERMOPLASTIC PRODUCTS

Ernst Schneider, Troisdorf; Manfred Simon, Niederkassel; Richard Weiss, Troisdorf; Alexander Höver, Troisdorf-Oberlar, and Christian Treutler, Troisdorf-Spich, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 137,964, April 27, 1971, abandoned. This application Nov. 26, 1973, Ser. No. 418,884
Claims priority, application Germany, Apr. 28, 1970, 2020758
Int. Cl. B29f 3/12; B29c 9/00
U.S. Cl. 264—40 27 Claims

1. A process for the production of shaped, marbled thermoplastic products wherein differently colored thermoplastic materials are separately introduced into an extruder having a feed zone, and ejection zone and a die means arranged in series with a rotatable conveying means extending through said zones and the materials are extruded from the die means, said process comprising producing at least two batches of differently colored thermoplastic materials in the form of pourable, fluidible, chargeable, pulverous, non-caking agglomerates, each batch produced by mixing a powdered thermoplastic resin, a coloring agent to impart a desired color to the powdered thermoplastic resin, a plasticizer for the thermoplastic resin, a stabilizer and a filler, mixing the resultant mixture, causing the temperature of said mixture to increase to an elevated temperature, the amount of plasticizer added to the mixture and the extent to which the temperature of the mixture is elevated being sufficient so that the thermoplastic resin particles superficially expand and are superficially sintered to one another to form a smeary, viscous-liquid-like mass, and then cooling and simultaneously mixing the resultant mass until said mass is formed into said agglomerates; alternately introducing the differently colored thermoplastic materials in each batch in the form of flowable thermoplastic agglomerates into the feeding zone of said extruder by means of separately operated vibrating metering means, each differently colored thermoplastic material being fed to said feed zone by its own metering means; mixing each of the thermoplastic materials in and conveying the thermoplastic materials through said zone of the extruder via said conveying means; cooling the feed zone of the extruder and heating the ejection zone of the extruder above the melting point of the thermoplastic material but below the decomposition temperature of the thermoplastic material; and thereafter extruding the resul-

tant mixture of the differently colored thermoplastic materials from the die means to form the desired shaped, marbled product.

3,906,066

INJECTION MOULDING PROCESS

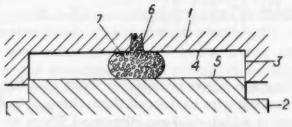
Ian Torrance Barrie, Wheathampsted, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 12, 1973, Ser. No. 322,940

Claims priority, application United Kingdom, Jan. 20, 1972, 2814/72

Int. Cl. B29d *27/00*; **B29f** *1/00*

U.S. Cl. 264—45.5 **8 Claims**



1. In a process for the production of injection moulded articles having a skin formed from an injection mouldable synthetic resin material surrounding a core formed from a dissimilar injection mouldable synthetic resin material at all points away from the sprue area of the moulding wherein a quantity of the skin material that is insufficient to fill the mould cavity but is sufficient to contact opposed mould walls of the mould cavity is injected, in a fluid state, into a mould cavity and said opposed mould walls are moved closer together so that the skin material therebetween is squeezed outwards from the injection orifice, and before the interior of the skin material has solidified, core material is injected, in a fluid state, to within the interior of the skin material so as to extend the latter to fill the mould cavity, the improvement characterized in that said movement of the mould walls is commenced before completion of injection of said quantity of skin material and continued until after commencement of injection of the core material.

3,906,067

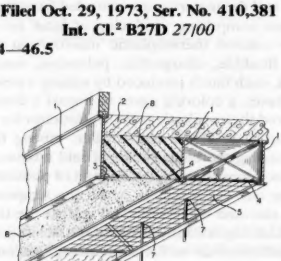
BRIDGE ICING DETERRENT

Howard E. Alspach, 4399 W. Lincoln Hwy., Gomer, Ohio 45809

Filed Oct. 29, 1973, Ser. No. 410,381

Int. Cl.² B27D *27/00*

U.S. Cl. 264—46.5 **3 Claims**



1. Method for reducing the formation of localized ice and frost deposited during freezing weather on pavements on roads over bridges and overpasses supported on I-beams parallel to the direction of the road, which comprises constructing immediately underneath said pavements over said bridges and overpasses a box-like form of predetermined thickness, wherein the lower side of said box-like structure is a thin, light sheet of material capable of holding a resin during introduction and setting of same in said box-like structure, said sheet being supported on bars the ends of which rest on the lower lips of the I-beams supporting the structure on which the said pavements are laid, and the lower surface of said pavement constituting the upper portion of said box-like structure, and introducing into said box-like structure, through a plurality of holes located in the bottom of said box-like structure a resin in fluid form selected from the group consisting of polystyrene, polyurethane, polyethane, cellulose acetate, epoxy, silicone and phenolic resinous material in an amount sufficient to fill said box-like structure completely when in foam form, converting said resin to foam form and permitting said foamed resin to set in solid form in contact with the lower surface of said pavements constituting the upper portion of said box-like structure.

3,906,068

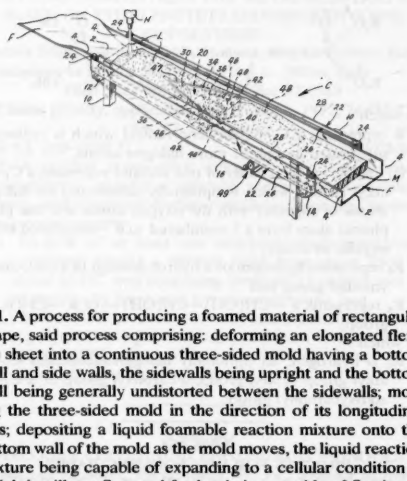
PROCESS FOR CONTINUOUSLY PRODUCING FOAMED MATERIAL OF RECTANGULAR SHAPE

Helmut G. Hanusa, Cape Girardeau, Mo., assignor to Textron, Inc., Providence, R.I.

Filed Dec. 13, 1973, Ser. No. 426,712

Int. Cl.² B29D *27/04*

U.S. Cl. 264—51 **11 Claims**



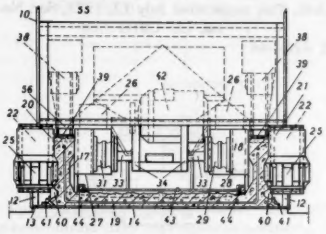
1. A process for producing a foamed material of rectangular shape, said process comprising: deforming an elongated flexible sheet into a continuous three-sided mold having a bottom wall and side walls, the sidewalls being upright and the bottom wall being generally undistorted between the sidewalls; moving the three-sided mold in the direction of its longitudinal axis; depositing a liquid foamable reaction mixture onto the bottom wall of the mold as the mold moves, the liquid reaction mixture being capable of expanding to a cellular condition in which it will not flow and further being capable of flowing as it expands; deforming the center portion of the bottom wall such that the center portion is at a higher elevation than the portions of the bottom wall immediately to the sides of it at the sidewalls, said deformation occurring at a location beyond the location where the liquid reaction mixture is deposited, yet at a location where the liquid reaction mixture in the mold is still capable of flowing, whereby some of the liquid reaction mixture will flow outwardly toward sidewalls; progressively broadening the deformation to transform the bottom wall into a planar configuration, the deformation in the bottom wall being such that it concentrates enough of the reaction mixture near the sidewalls to cause the reaction mixture to foam about as high at the sidewalls as midway between sidewalls, whereby the foam material located on the flat bottom wall beyond the deformation therein will possess a rectangular shape in cross-section.

3,906,069

METHOD FOR THE MANUFACTURE OF ELONGATE CONCRETE BUILDING BLOCKS

Sven Melker Nilsson, Kallered, Sweden, assignor to Ingenjorsfirman Nilcon AB, Kallered, Sweden

Division of Ser. No. 195,200, Nov. 3, 1971, Pat. No. 3,740,176. Claims priority, application Sweden, Dec. 15, 1970, 16956/70
This application Feb. 26, 1973, Ser. No. 335,485
Int. Cl. B28b *1/08*
U.S. Cl. 264—70 4 Claims



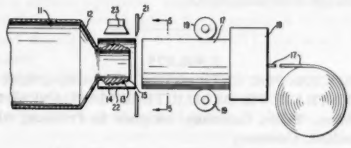
1. A method of manufacturing through slide-moulding concrete building elements of elongate configuration, said method comprising the stage of discharging a concrete mixture vertically from a continuously advancing container onto a horizontally ending bed, vibrating the upper surface of said concrete to form a layer having mutually parallel longitudinal edges and a smooth upper surface, moulding said layer between two walls at least one of which consisting of a vertically positioned feeder band, rolling said feeder band in synchronism with the speed of advancement of the container, and vibrating at least one of said forming walls in the lateral direction compacting the concrete mixture being discharged into the space formed between said band and said forming walls from said container.

3,906,070

METHOD OF PROTECTIVELY COVERING METAL THREADS

Dusan S. Lajovic, Smithfield, Australia, assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 75,840, Sept. 28, 1970, abandoned. This application Oct. 6, 1972, Ser. No. 295,538
Int. Cl.² B28B *11/08*; B29C *27/00*; B29D *7/16*
U.S. Cl. 264—159 17 Claims



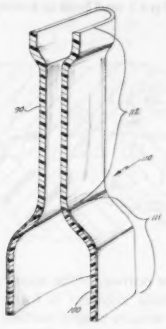
1. A method of providing a substantially permanent plastic covering upon a first member having an externally threaded metal portion for protection of the surface of the threads against abrasion comprising: disposing a thin-walled collar of heat shrinkable synthetic plastic material about said first member, said collar being axially located to surround said externally threaded portion of said first member and an anchoring recess in said first member heating said collar to soften said material and shrink it in axially fixed relation about and in substantial conformity with the surfaces of the threads of said threaded portion and said recess and, while said collar is warm and soft, relatively rotating said member in assembly with another member having internal threads to correspond with said external threads of said first member to permanently conform the said plastic material to the threaded contours of said members.

3,906,071

DIP MOLDING PROCESS

William J. Cook, Rockford, and Gordon A. Eliens, Grand Rapids, both of Mich., assignors to Leon Chemical & Plastics Div. of U.S. Industries Inc., Grand Rapids, Mich.

Filed Apr. 30, 1973, Ser. No. 355,900
Int. Cl.² B29D *9/00*
U.S. Cl. 264—255 33 Claims



1. A dip molding process comprising: providing a first source of a first dip molding plastisol having a first durometer rating and a second source of a second dip molding plastisol having a second durometer rating; heating a dip molding mold to a temperature higher than the temperature normally required to dip mold in the second plastisol; dipping said mold into said first plastisol a distance sufficient to coat only a portion of the mold surface and for a time sufficient to coat said portion to the desired thickness; subsequently dipping the partially coated mold into the second plastisol a distance greater than said portion and for a time sufficient to coat the first coated portion and the portions of said mold not already coated to a desired thickness; delaying the initiation of said subsequent dip into said second plastisol for a period of time of approximately 30 to 90 seconds after said mold leaves said first plastisol and maintaining said mold in an atmosphere cooler than the temperature of said mold during said delaying step to allow the first coating of plastisol on said mold to gel somewhat and allowing the surface of said coating to cool somewhat prior to initiation of said subsequent dip; and subsequently removing the resulting molded article from said mold.

3,906,072

MOLDING PROCESS

Thomas W. Haas, Watchung; Richard L. Mach, Milford; Edward Studley, North Plainfield, and Robert Hoffman, Clark, all of N.J., assignors to American Standard, Inc., New York, N.Y.

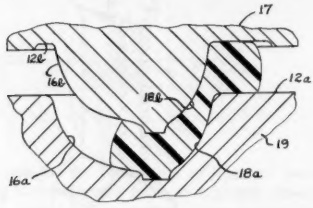
Continuation of Ser. No. 187,381, Oct. 7, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,214
Int. Cl. B29g *1/00*
U.S. Cl. 264—322 1 Claim

1. A single stroke compression molding process adapted for the production of a nonporous plumbing fixture, such as a lavatory having a deep dished bowl section and a connecting peripheral deck section, the deep dished bowl section having a steep wall forming an acute angle of about 18° with the vertical plane, the compression mold having two segments a charge-receiving mold segment and a coacting mating mold segment, the process consisting essentially of:

charging the receiving mold segment with a single flattened cake-like mass of thermosetting resin consisting of porous cellulose filled melamine molding powder in the form of

a cake which is preheated to a temperature of about 200°F by positioning the cake on its lower edge near the center and bottom of the receiving mold segment and its opposite upper edge extending substantially above the receiving mold segment, the cake portion inclined to a wall of the receiving mold segment and forming the steep wall of the dished bowl section while the portion of the mass projecting above the receiving mold segment serving as the charge for the deck section;

closing the mold by moving the co-acting mating mold segment into the charge-receiving mold segment and subjecting the mass of thermosetting resin to pressure of about 4,000 p.s.i. and heat at a temperature of about 300°



F so that the portion of the mass lying within the charge-receiving mold segment is forced to flow downwardly against the steeply sloped surface of the receiving mold segment and the portion of the charge projecting above the receiving mold segment is forced to flow upwardly and to break away against the deck forming surface of the receiving mold segment to form the major part of the deck; and,

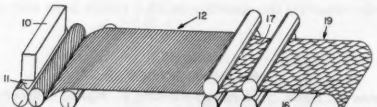
heating and maintaining the mold segments at a temperature of about 300° F for a period of time from about 2 to about 4 minutes and pressure of about 4,000 p.s.i. whereby a nonporous plumbing fixture is formed in a single compression step.

3,906,073

METHODS OF MAKING NETWORK STRUCTURES

Charles W. Kim, Wilmington; Chia-Seng Liu, Newark, and Lawrence J. Logan, Jr., Wilmington, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed July 5, 1973, Ser. No. 376,837
Int. Cl.² B29H *7/18*
U.S. Cl. 264—147 **7 Claims**



1. A method of making network structures comprising:

forming in a sheet of crystallizable thermoplastic polymer a plurality of parallel continuous ribs extending from one side of the sheet to the other at an angle to the longitudinal axis of the sheet with webs of reduced thickness interconnecting adjacent ribs, said ribs having a thickness at least three times the thickness of said webs, and said ribs having a cross-sectional area at least two times the cross-sectional area of said webs;

crystallizing said sheet to at least a 30 percent crystalline content; and

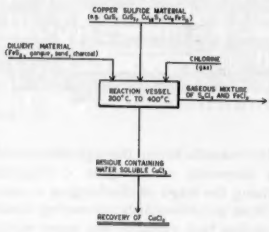
drawing said sheet in at least a first direction which is between about 45° and 70° to the longitudinal axes of said ribs without allowing a substantial reduction in width and then drawing in a second direction perpendicular to said first direction to orient said ribs and webs and to split said webs into fibrils and open said sheet into a uniform network structure having continuous ribs interconnected by fibrils.

3,906,074

PROCESS FOR CHLORINATING COPPER SULFIDE MINERALS

Bernhard W. Spreckelmeyer, Leverkusen, Germany, assignor to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 131,947, April 7, 1971, Pat. No. 3,832,440. This application July 12, 1973, Ser. No. 378,787
Int. Cl.² C01G *3/04*
U.S. Cl. 423—40 **4 Claims**



1. A process for treating concentrated copper sulfide minerals in substantially dry condition for the recovery of substantially uncontaminated copper values in the form of water-soluble cupric chloride, comprising mixing a copper sulfide mineral concentrate with a diluent material comprising silica, said copper sulfide mineral concentrate initially having a diluent material content, if any, significantly less than a molar ratio of about 1:1 diluent to copper; contacting the mixture with at least a stoichiometric amount of chlorine gas based on the amount of chlorinatable material present in the mixture at a temperature between about 300° and about 400°C., the added diluent material being sufficient in amount to be effective for the formation of a reaction product containing water-soluble cupric chloride, other contaminating chlorides being volatilized during the contacting operation; and recovering substantially uncontaminated cupric chloride from the reaction product by dissolving with water and separating the resulting solution from the remaining solids.

3,906,075

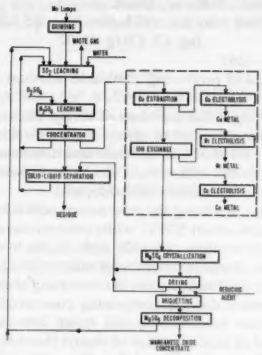
PROCESS FOR EXTRACTING A MANGANESE CONCENTRATE FROM MARITIME MANGANESE ORE

Dieter Menz, Peine, Germany, assignor to Preussag Aktiengesellschaft, Germany

Filed Oct. 10, 1972, Ser. No. 296,353
Claims priority, application Germany, Oct. 12, 1971, 2150785
Int. Cl. C01g *45/00, 47/00, 57/00;* **C22b** *47/00, 61/00*
U.S. Cl. 423—52 **4 Claims**

1. A process for extracting a manganese concentrate, copper, nickel and cobalt from maritime manganese ore, containing said elements in admixture with iron, said process comprising the steps of finely grinding said ore, leaching said finely ground ore, in acidic aqueous suspension, with sulfur dioxide or sulfurous acid at a temperature of 90°–100°C. and at a pH value above 3.0, to form an aqueous solution including manganese sulfate, without dissolving the iron, and a leach residue containing undissolved iron oxides, adding manganese sulfate to said aqueous suspension at the start of said sulfur dioxide

or sulfurous acid leaching step, separating said aqueous solution from said residue, separating copper, nickel and cobalt



from said aqueous solution, and thereafter recovering said manganese concentrate from said aqueous solution.

3,906,076
PROCESS FOR PRODUCING ZEOLITE X MOLECULAR SIEVE BODIES

Jorge Alberto Goytisolo, Lutherville; Donald Dongsuk Chi, and Hanju Lee, both of Columbia, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 3, 1973, Ser. No. 403,029
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—118 **10 Claims**

1. A method of forming shaped zeolite X materials comprising:

a. forming an admixture of zeolite X and meta-kaolin clay wherein said zeolite X is present in a content of about 70 percent to 90 percent by weight and said meta-kaolin clay comprising the remainder of the admixture;

b. adding a sodium hydroxide solution containing about 25 percent to 110 percent of the Na_2O required to convert said meta-kaolin component to zeolite X and thereby forming a paste-like admixture;

c. forming said admixture into shapes;

d. aging said shapes at about 10°C to 50°C for about 5 to 40 hours;

e. adjusting the content of Na_2O of said aged shapes to about 110 percent of that required to convert said meta-kaolin component to zeolite X by immersing said shapes in a sodium hydroxide solution and hydrothermally converting said meta-kaolin clay to zeolite X by maintaining said shapes at about 65°C to 110°C for about 4 to 20 hours;

f. washing said zeolite X shapes to remove any excess free sodium hydroxide; and

g. drying and activating said zeolite X shapes.

3,906,077
PURIFICATION OF FERRIC CHLORIDE

Theodore A. Rado, Oklahoma City, and Thomas C. Nelson, Edmond, both of Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Feb. 15, 1974, Ser. No. 442,803
Int. Cl.[2] C01G *49/10*
U.S. Cl. 423—149 **11 Claims**

1. In a process wherein an iron containing ore is chlorinated in a fluid bed reactor to produce an effluent gaseous mixture including ferric chloride and non-volatile impurities, the improvements for recovering substantially pure ferric chloride from said gaseous mixture comprising the steps of:

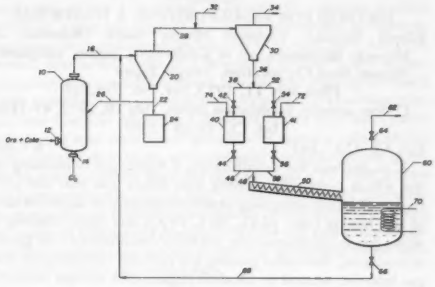
a. introducing the mixture into a hot solids separation zone at a temperature above the dew-point of ferric chloride wherein a major portion of the non-volatile impurities are removed,

b. withdrawing the gaseous mixture containing a minor portion of the non-volatile impurities,

c. cooling said gaseous mixture to a temperature below the dew-point of ferric chloride whereby the ferric chloride is precipitated as a solid,

d. introducing the gaseous mixture into a cold solids separation zone wherein the ferric chloride and non-volatile impurities are removed from the gas,

e. introducing the solid ferric chloride and non-volatile impurities into a treatment zone,



f. maintaining the treatment zone at a temperature within a range of from about 300° to about 700°C. and at a pressure of from about 1.2 to 50 atmospheres, said temperature being within about 10°C. of the boiling point of the mixture, at the selected pressure, to provide a liquid-vapor interface within the treatment zone,

g. maintaining the liquid in an agitated state in the treatment zone to prevent settling of non-volatile impurities and form a slurry of the non-volatile impurities in liquid ferric chloride,

h. withdrawing the slurry of non-volatile impurities and liquid ferric chloride from the treatment zone at a rate sufficient to maintain the solids content of the slurry below about 20 percent by weight, and recycling the slurry to the hot solids separation zone and,

i. recovering an overhead fraction from the treatment zone comprising substantially pure ferric chloride vapor.

3,906,078
PROCESS FOR REMOVING SULFUR OXIDES FROM INDUSTRIAL WASTE GAS

Gerhard Hausberg, Essen-Bredeney; Georg Kruger, Lunen, and Karl-Martin Zentgraf, Essen, all of Germany, assignors to Firma G. Bischoff Bau Kompletter Gasreinigungs- und Wasserruckkuhlanlagen KG, Essen, Germany

Continuation-in-part of Ser. No. 197,996, Nov. 11, 1971, abandoned, which is a continuation of Ser. No. 813,133, April 3, 1969, abandoned. This application July 7, 1972, Ser. No. 269,773
Int. Cl. C01b *17/00*
U.S. Cl. 423—242 **3 Claims**

1. A method of removing sulfur oxides from a hot waste gas, comprising the steps of:

passing a stream of sulfur-oxide-containing waste gas at a temperature above 100°C through a treatment zone;

saturating said stream in said treatment zone with water vapor in the presence of comminuted particles of a substantially water-insoluble substance dispersed through the stream, the latter containing alkaline matter selected from the group of calcium oxide, calcium hydroxide, and calcium carbonate and capable of reacting with said sulfur oxides, said gas stream being saturated by spraying same with an aqueous medium upstream of a constriction located at the exit end of said treatment zone, said parti-

cles being admixed with the gas stream ahead of said treatment zone;

cooling said stream by substantially adiabatic expansion upon emergence of the stream from said treatment zone to a level low enough to cause water condensation with resulting precipitation of water on said particles in the form of droplets containing sulfur compounds obtained by reaction of said alkaline matter with said sulfur oxides; and

separating said droplets from the gas stream.

3,906,079

METHOD FOR DESULFURIZING A WASTE GAS

Kiheiji Tamaki; Yoshiaki Miura; Akira Okamoto, and Masaaki Nakamura, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed July 11, 1973, Ser. No. 378,313

Claims priority, application Japan, July 18, 1972, 47-71865

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **8 Claims**

1. A method for desulfurizing a waste gas containing SO_2 gas which comprises passing said waste gas into the acidic region of a first absorbing vessel containing an aqueous slurry of slag having CaO, Al_2O_3, SiO_2, Fe_2O_3 and M_nO, wherein the waste gas is simultaneously partially desulfurized and gypsum is produced, thereafter passing the partially desulfurized waste gas into the neutral to alkaline region of a second absorbing vessel containing partially spent slurry, wherein the remaining SO_2 present in the waste gas is removed therefrom, supplying a fresh aqueous slurry of slag to the second absorbing vessel while the partially desulfurized waste gas is being passed therethrough, discharging the partially spent slurry of slag contained in the second absorbing vessel at the same rate as fresh aqueous slurry is supplied to the second absorbing vessel, and withdrawing the desulfurized waste gas from the second absorbing vessel.

3,906,080

REMOVAL OF SULFUR DIOXIDE FROM GASES CONTAINING SULFUR DIOXIDE AND OXYGEN

Everett Gorin; Metro D. Kulik, and Robert T. Struck, all of Pittsburgh, Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 309,869, Nov. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 222,760, Feb. 2, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,683

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. In a process for removing sulfur dioxide from a gas stream containing SO_2 and O_2 in which said gas stream is contacted in a scrubber with an aqueous solution containing a sulfite-forming reagent selected from the class consisting of alkali metal hydroxides and carbonates and ammonium hydroxide and carbonate in at least the amount required to convert the SO_2 to sulfite at scrubbing conditions which are selected to promote reaction of the SO_2 with the sulfite-forming reagent, to thereby yield an effluent gas stream of reduced sulfur dioxide content and an effluent aqueous solution containing alkali metal or ammonium sulfite, the IMPROVEMENT which comprises:

a. introducing fresh aqueous scrubbing solution into said scrubber which contains, in addition to said sulfite-forming reagent, at least 15 percent by weight of an alkali metal or ammonium thiosulfate; and thereafter

b. operating the scrubber at conditions selected to maintain the pH of the solution leaving the scrubber between 6.3 and 8.0, and to yield an effluent gas stream which is substantially free of SO_2 and an effluent aqueous scrubbing solution which contains substantially all the sulfite produced in the scrubber by the reaction of SO_2 and the sulfite-forming reagent.

3,906,081

FLUIDIZED REACTOR REDUCTION OF UF_6 TO UO_2

Richard K. Welty, Richland, Wash., assignor to Exxon Nuclear Company Inc., Bellevue, Wash.

Filed May 31, 1973, Ser. No. 365,508

Int. Cl. C01g *43/02*

U.S. Cl. 423—261 **7 Claims**

1. A method of producing sinterable uranium dioxide comprising:

a. establishing a fluidized bed of uranyl fluoride solids;

b. maintaining the bed of uranyl fluoride solids at temperatures in excess of 730°C. while countercurrently contacting said solids with excess steam to convert the uranyl fluoride to triuranium octoxide; and

c. thereafter fluidizing the triuranium octoxide at temperatures below about 500°C. while countercurrently contacting the triuranium octoxide with excess hydrogen in the presence of steam whereby uranium dioxide is formed.

7. A staged fluidized process of converting uranium hexafluoride to uranium dioxide comprising countercurrently introducing uranium hexafluoride and steam into contact with a first fluid bed of seed particles of uranyl fluoride solids; maintaining the first bed of uranyl fluoride solids at temperatures in the range of about 658° to 680°C. whereby uranium hexafluoride is converted to uranyl fluoride; transferring said uranyl fluoride solids to a second fluid bed; maintaining said second fluid bed at temperatures in the range of about 730° to about 780°C.; while countercurrently contacting said second fluidized bed of uranyl solids with excess steam for a time sufficient to convert uranyl fluoride solids to triuranium octoxide; transferring said triuranium octoxide solids into a second reactor; fluidizing and countercurrently contacting said triuranium octoxide solid with excess hydrogen in the presence of steam at temperatures in the range of about 450° to 500°C. whereby said triuranium octoxide solids are converted to uranium dioxide.

3,906,082

METHOD OF MAKING DIAMONDS SYNTHETICALLY

Alexandr Alexandrovich Shulzhenko, Novo-Konstantinovskaya, 17, kv. 27, and Anatoly Fedorovich Getman, Syretskaya, 38, kv. 2, both of Kiev, U.S.S.R.

Continuation of Ser. No. 68,006, Aug. 28, 1970, abandoned. This application Sept. 26, 1972, Ser. No. 292,396

Int. Cl.[2] B01J *3/06;* **C01B** *31/06*

U.S. Cl. 423—446 **1 Claim**

1. A method of synthesizing diamonds comprising subjecting to a temperature of at least about 1,800°C, and a pressure of at least about 85 kbar for a time required for forming a diamond a reaction mixture consisting essentially of a homogeneous mixture of a carbonaceous material, silver chloride, and at least one element selected from the group consisting of aluminum and boron.

3,906,083

PROCESS FOR THE CONVERSION OF ANHYDRITE INTO GYPSUM

James Stanley George, Brampton, England, assignor to BPB Industries, Ltd., England

Filed May 9, 1973, Ser. No. 358,789

Claims priority, application United Kingdom, May 11, 1972, 22195/72

Int. Cl.[2] C01F *11/46*

U.S. Cl. 423—555 **9 Claims**

1. A process for preparing gypsum from anhydrite with an hydration period of 2 to 200 days comprising the steps of:

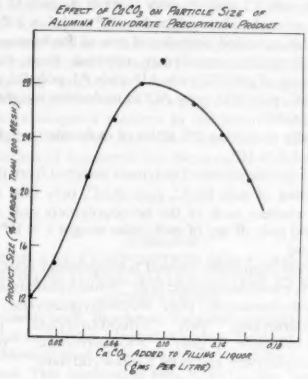
1. mixing powdered anhydrite starting material which has an hydration period of at least 2 to 200 days and which passes a 7 mesh screen with about the amount of water necessary for complete hydration of the anhydrite to gypsum;

2. compressing the resultant mixture of anhydrite and water into compacted bodies having a porosity of from 10 to 43%; and
3. allowing the anhydrite in said bodies to hydrate at temperatures to produce a substantially dry body of gypsum.

3,906,084
PRECIPITATION OF ALUMINA TRIHYDRATE FROM BAYER PREGNANT LIQUORS

Bohdan Gnyra, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Sept. 21, 1971, Ser. No. 182,481
Int. Cl. C01f *7/02*
U.S. Cl. 423—629 **7 Claims**



1. A method of precipitating alumina trihydrate from filtered Bayer pregnant liquor saturated with respect to alumina trihydrate and having a caustic content above about 160 gpl caustic measured as Na_2CO_3 to increase the amount of alumina trihydrate having a particle size greater than 325 mesh, which comprises adding to said filtered Bayer pregnant liquor fine seed alumina trihydrate as a precipitating agent for the precipitation of alumina trihydrate from said filtered Bayer pregnant liquor and substantially simultaneously with the addition of said fine seed alumina trihydrate to said filtered Bayer pregnant liquor adding an amount of finely divided solid calcium carbonate in the range about 0.02–0.2 gpl of said filtered Bayer pregnant liquor whereby the precipitated alumina trihydrate has an increased amount of alumina trihydrate having a particle size greater than 325 mesh as compared with the alumina trihydrate precipitated in the absence of said added calcium carbonate.

3,906,085
DETERMINATION OF HYPERTENSION ASSOCIATED WITH ELEVATED RENIN LEVELS

Richard P. Miller, Zionsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 362,574, May 21, 1973, Pat. No. 3,873,681, which is a division of Ser. No. 226,744, Feb. 16, 1972, Pat. No. 3,784,686. This application Dec. 4, 1974, Ser. No. 529,675
Int. Cl.[2] A61B *5/02;* **A61K** *29/00, 37/48*
U.S. Cl. 424—9 **1 Claim**

1. Method of determining the presence of elevated renin levels in a hypertensive mammal which comprises intravenously administering pepstatin to said mammal and then determining whether or not there is an immediate transitory fall in blood pressure whereby said fall in blood pressure demonstrates hypertension associated with increased renin levels.

3,906,086
TIMED-RELEASE ASPIRIN

Michael G. Guy, Ferdonia, and Richard G. Powers, Saukville, both of Wis., assignors to Richard G. Powers, Saukville; Michael G. Guy, Ferdonia; James F. Stern and Robert M. Stern, both of Milwaukee, all of, Wis.

Continuation of Ser. No. 163,739, July 19, 1971, abandoned. This application Jan. 22, 1974, Ser. No. 435,418
Int. Cl.[2] A61J *3/10;* **A61K** *27/12*
U.S. Cl. 424—20 **7 Claims**

1. In a method for making an aspirin tablet including the steps of mixing uncoated particles of standard 80 mesh USP aspirin with a sufficient amount of a non-aqueous solution, containing about 5 to about 18 weight % cellulose acetate phthalate, a suitable amount of a pharmaceutically acceptable plasticizer to permit granules formed from said particles to be pressed into tablets without a tabletting excipient, and a pharmaceutically acceptable solvent, to coat and impregnate each of the particles with said solution, forming the resulting mixture into discrete plasticized granules larger than said particles, drying said plasticized granules to remove substantially all the solvent therefrom, reducing said dried plasticized granules to a size whereby they can pass through a 20 mesh screen and homogeneously mixing said reduced plasticized granules, the improvement consisting essentially of the steps of pressing said reduced plasticized granules without any tabletting excipients into dosage-size tablets to provide an aspirin tablet having timed-release characteristics.

3,906,087
SUSTAINED RELEASE OF METHANTHELINE

James S. Y. Sim; Maurice H. Van Horn; Arthur I. Cohen; Stanley E. Gordesky, and Stanley I. Gordon, all of Rochester, N.Y., assignors to Union Corporation, Verona, Pa.

Filed Sept. 10, 1973, Ser. No. 395,862
Int. Cl.[2] A61K *27/12*
U.S. Cl. 424—22 **1 Claim**

1. A sustained release oral ingestion 33 hour methantheline eluting pharmaceutical composition comprising:
   A. polymerized and cured matrix of water-insoluble but water-swellable hydrophilic polymer of a monomer mixture containing:
      1. 2-hydroxyethyl methacrylate; and
      2. divinyl benzene wherein said monomer mixture contains about 197.2 parts by weight of (1) per about 2 parts by weight of (2); and
   B. said polymerized and cured matrix having been soaked for about 12 hours in isotonic saline solution containing per 5 ml of isotonic saline solution at least about 100 mg of methantheline bromide in an amount sufficient for the total dosage requirement adapted to gradually elute methantheline upon oral ingestion during 33 hours of a treatment period; and thereby the methantheline bromide being entrapped in said matrix.

3,906,088
PHARMACEUTICAL TABLETS COATED WITH VINYL TERPOLYMERS

Michel Trichot, Maisons-Alfort, France, assignor to Societe des Produits Chimigues de la Montagne Noire, Paris, France

Filed Dec. 26, 1973, Ser. No. 427,560
Claims priority, application France, Dec. 26, 1972, 72.46195
Int. Cl.[2] A61K *9/32*
U.S. Cl. 424—33 **6 Claims**

1. A coated pharmaceutical tablet comprising a tablet core containing an active pharmaceutical ingredient coated with a film of a ternary copolymer consisting essentially of from 60 to 87% by weight of units coming from vinyl acetate, from 3 to 30% by weight of units coming from crotonic acid and from 10 to 37% by weight of units coming from a maleic ester.

3,906,089

SYNERGISTIC CHRYSANTHEMATE INSECTICIDES

Yoshitoshi Okuno, Toyonaka; Akira Toyoura, and Akio Higo, both of Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 15, 1974, Ser. No. 514,776

Claims priority, application Japan, Oct. 15, 1973, 48-116231

Int. Cl. A01n *9/22, 9/24*

U.S. Cl. 424—45 7 Claims

1. An insecticidal composition containing an inert carrier and as active ingredients an insecticidally effective amount of the mixture consisting of (I) (±)2-allyl-3-methyl-cyclopent-2-en-1-one-4-yl (+)transchrysanthemate or (II) (+)2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl (+)trans-chrysanthemate and III N-(3,4,5,6-tetrahydrophthalimido)-methyl (±)cis, trans-chrysanthemate or (IV) N-(3,4,5,6-tetrahydrophthalimide)-methyl (+)trans-chrysanthemate wherein the ratio of compounds (I) or (II) to compounds (III) or (IV) is 1:1 to 1:4.

3,906,090

CLEAR DENTIFRICE

Daniel Colodney, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 287,001, Sept. 7, 1972, which is a continuation-in-part of Ser. No. 139,240, April 30, 1971, abandoned. This application Sept. 10, 1974, Ser. No. 504,798

Int. Cl. A61k *7/16*

U.S. Cl. 424—52 8 Claims

1. A visually clear dentifrice comprising about 5–30% by weight of a dentally acceptable substantially water-insoluble particulate polishing agent in a gel vehicle having substantially the same refractive index as said polishing agent, said polishing agent being a synthetic amorphous complex aluminosilicate salt of sodium in which silica is interbonded with alumina and which contains up to 3.3% by weight of the polishing agent of alumina, and in which the mol ratio of silica to alumina is at least about 45:1, said polishing agent having a refractive index of about 1.44–1.47, up to about 20% by weight of moisture and up to about 10% by weight sodium oxide and said polishing agent being substantially invisible in said gel vehicle.

3,906,091

HAIR-SETTING LOTION CONTAINING A REDUCING AGENT

Charles Zviak, Franconville, and Giuliana Ghilardi, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 100,840, Dec. 22, 1970, abandoned. This application Oct. 12, 1973, Ser. No. 405,869

Claims priority, application Luxemburg, Dec. 24, 1969, 60093

Int. Cl.[2] A61K *7/06, 7/11*

U.S. Cl. 424—70 6 Claims

5. A method for treating peroxide containing human hair for neutralizing the peroxide therein comprising contacting said peroxide-containing hair with an effective amount to neutralize said peroxide of an aqueous or hydroalcoholic solution containing a member selected from the group consisting of butyl hydroxy anisole, dodecyl gallate, propyl gallate and octyl gallate present in an amount of about 0.02 to 2 percent by weight of said solution.

3,906,092

STIMULATION OF ANTIBODY RESPONSE

Maurice R. Hilleman, Lafayette Hill; Alfred A. Tytell, Lansdale, and Allen F. Woodhour, Horsham, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 26, 1971, Ser. No. 202,565

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 15 Claims

1. In a vaccine preparation for administration to a living host of the type consisting of an antigen and (an) a water-in-oil or oil-in-water emulsion type adjuvant, wherein the improvement comprises (the addition to the vaccine of) an additional component in said vaccine preparation which comprises a fraction of a microgram to 10 milligrams per dose of an agent selected from the group consisting of:

1. a homopolymer selected from the group consisting of poly I, poly C, poly A, poly U, poly X, poly G and poly DHU, of molecular weight 1×10^5 to 1.5×10^6,
2. a double stranded complex of two of the homopolymers,
3. an alternating copolymer selected from the group consisting of poly IC, poly AU, poly AI, poly IU, poly CU, poly AC, poly GU, poly AG of molecular weight 1×10^5 to 1.5×10^6,
4. naturally occurring DS-RNA of molecular weight of 1×10^5 to 1.5×10^6,
5. hybrid double stranded polymers selected from the group consisting of poly G:dC, poly dG:C, poly I:dC and poly dI:C, wherein each of the homopolymers poly dC, poly dG, and poly dI are of molecular weight 1×10^5 to 1.5×10^6, and
6. a known chemically altered homopolymer selected from poly N_1-methyladenylate, poly "6-methyladenylate", poly N_7-methylinosinate, poly N_7-methylguanylate, poly 5-methyluridylate, poly 5-fluorouridylate, poly 5-bromouridylate, poly 5-iodouridylate, poly 5-bromocytidylate and poly 5-iodocytidylate.

3,906,093

MITHRAMYCINS AND PROCESS THEREFOR

Ben A. Sobin, Manhassett, N.Y.; John B. Routien, Lyme, Conn.; Koppaka V. Rao, Cambridge, Mass.; William S. Marsh, Wanaque, N.J., and Aline L. Garretson, East Lansing, Mich., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 617,442, Dec. 19, 1966, abandoned, which is a continuation-in-part of Ser. No. 317,399, Oct. 15, 1963, abandoned, which is a continuation-in-part of Ser. Nos. 39,572, June 29, 1960, abandoned, and Ser. No. 696,676, Nov. 15, 1957, abandoned. This application Aug. 13, 1968, Ser. No. 752,197

Int. Cl. A61k *21/00*

U.S. Cl. 424—119 15 Claims

1. Mithramycin A, an acidic substance which is relatively soluble in water, lower alcohols, acetone, ethyl acetate and methyl isobutyl ketone, slightly soluble in diethyl ether and benzene, and substantially insoluble in petroleum ether, carbon tetrachloride and cyclohexane, which is capable of forming salts with bases, the pure crystalline dihydrate of which is yellow and contains the elements carbon, hydrogen, and oxygen in substantially the following percentages by weight: Carbon 55.5%, Hydrogen 7.2%, Oxygen 37.3% (by difference) and has the molecular formula $C_{52}H_{76}O_{24}.2H_2O$; which displays ultraviolet absorption maxima in methanol solution at 230 and 278 mμ, which has an equivalent weight of substantially 1115 ± 15 and a pK_a value of 7.6 ± 0.2, which exhibits a dull yellow fluorescence when irradiated with ultraviolet light, and which as a 0.03 percent dispersion in potassium bromide exhibits absorption maxima in the infrared region of the spectrum at 736, 763, 803, 847, 901, 950, 978, 1000, 1064, 1118, 1160, 1228, 1259, 1293, 1320, 1370, 1396, 1440, 1500, 1580, 1626, 1720, 2850, 2910, 2950, 3390, cm^{-1}, and which when dissolved in methanol at a concentration of 1 percent has the specific rotation −58°; the crystalline anhydrous form of which is yellow, melts at 184°–187° C. and

contains the elements carbon, hydrogen and oxygen in substantially the following percentages by weight: Carbon 57.70%, Hydrogen 7.2%, Oxygen 35.1%, (by difference) and has the molecular formula $C_{58}H_{76}O_{24}$; and which displays ultraviolet absorption maxima in methanol solution at 230 and 278 mμ and which as an 0.03 percent dispersion in potassium bromide exhibits absorption maxima in the infrared region of the spectrum at 806, 852, 908, 952, 983, 1004, 1071, 1126, 1170, 1236, 1266, 1300, 1330, 1374, 1515, 1631, 1724, 2890 and 3413 $cm.^{-1}$; and which on thin layer chromatography in the system methanol: isopropanol:methyl ethyl ketone (1:1:8) has an R_f value of 0.6–0.7; the crystalline magnesium salt of which is bright yellow, decomposes at 210°–215° C., has a pK_a value of 4.5–4.7 and an equivalent weight of 1110, and contains the elements carbon, hydrogen and magnesium is substantially the following percentages by weight: Carbon 55.64%, Hydrogen 7.19%, Magnesium 1.15% and has the molecular formula $(C_{58}H_{75}O_{24})_2Mg$; the pure crystalline dihydrated sodium salt of which is bright yellow and contains the elements carbon and hydrogen in substantially the following percentages by weight: Carbon 54.65%, Hydrogen 6.95% and has the molecular formula $C_{58}H_{75}O_{24}Na.2H_2O$, which displays ultraviolet absorption maxima in methanol solution at 240, 285, 315, and 425 mμ and when dissolved in methanol at a concentration of 1 percent has the specific rotation +38.8°.

3,906,094

METHOD AND COMPOSITION FOR COMBATTING FUNGUS WITH FUNGICIDALLY-ACTIVE PYRIMIDINE DERIVATIVES

Brian Kenneth Snell, Bracknell, England, assignor to Imperial Chemical Industries Limited, London, England

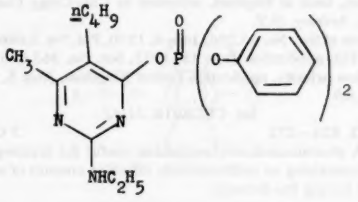
Continuation-in-part of Ser. No. 624,126, March 20, 1967, abandoned. This application Feb. 9, 1971, Ser. No. 114,079

Claims priority, application United Kingdom, Mar. 31, 1966, 14266/66; Mar. 31, 1966, 14267/66

Int. Cl.² A01N 9/36

U.S. Cl. 424—200 **2 Claims**

1. A method of combating fungus of plants and animals which comprises applying to the fungus a pyrimidine derivative of the formula:



3,906,095

NOVEL PREGNANOIC ACID DERIVATIVES

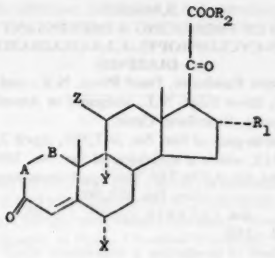
Henry Laurent; Rudolf Wiechert; Klaus Prezewowsky; Helmut Hofmeister; Erich Gerhards; Karl Heinz Kolb, and Klaus Mengel, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Division of Ser. No. 284,710, Aug. 30, 1972, Pat. No. 3,824,260. This application Apr. 9, 1974, Ser. No. 459,412

Int. Cl.² A61K 17/00

U.S. Cl. 424—243 **63 Claims**

1. A pharmaceutical composition adapted for topical administration comprising an anti-inflammatory effective amount of a compound of the formula



wherein X is a hydrogen, halogen or methyl; Y is hydrogen or halogen; Z is hydroxy or halogen having an atomic weight no greater than Y; R_1 is hydrogen or methyl; R_2 is hydrogen, alkali-metal, or saturated or unsaturated hydrocarbon of 1–18 carbon atoms which is unsubstituted or substituted by up to 3 of hydroxy, halo, alkoxy, carboxy, carbalkoxy, amino, alkylamino, dialkylamino, nitro, sulfato and alkali-metal salts thereof wherein alkyl in each instance contains 1–4 carbon atoms; and —A—B— is —CH=CH—, —CCl=CH—, and when at least one of X, Y and R_1 are other than hydrogen, $—CH_2—CH_2$; and a pharmaceutically acceptable carrier.

3,906,096

NOVEL 11β-ALKOXY STEROIDS

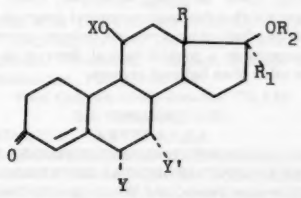
Robert Bucourt, Paris; André Pierdet, Noisy Le Sec, and Jean Salmon, Paris, all of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 201,564, Nov. 23, 1971, Pat. No. 3,810,887. This application Mar. 4, 1974, Ser. No. 447,561

Int. Cl.² A61K 31/56

U.S. Cl. 424—243 **8 Claims**

1. An antiandrogenic and antiestrogenic composition comprising an effective amount of a compound of the formula



wherein R and X and alkyl of 1 to 4 carbon atoms, R_1 is a saturated or unsaturated hydrocarbon of 1 to 6 carbon atoms, R_2 is selected from the group consisting of hydrogen and acyl of an organic carboxylic acid of 1 to 18 carbon atoms and Y and Y′ are selected from the group consisting of hydrogen and methyl and the enolic esters thereof with an organic carboxylic acid of 1 to 18 carbon atoms and a pharmaceutical carrier.

3,906,097
METHOD OF PRODUCING A DEPRESSANT EFFECT USING 5-CYCLOPROPYL-1,2,4-OXADIAZOL-3-YL DIAZINES

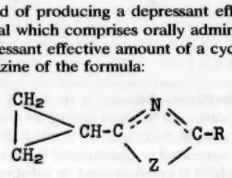
William Joseph Fanshawe, Pearl River, N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 347,307, April 2, 1973, Pat. No. 3,857,843, which is a division of Ser. No. 288,219, Sept. 11, 1972, Pat. No. 3,770,739. This application Aug. 20, 1974, Ser. No. 498,902

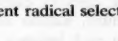
Int. Cl.[2] A61K *31/495, 31/505*

U.S. Cl. 424—250 **5 Claims**

1. A method of producing a depressant effect in a warm-blooded animal which comprises orally administering to said animal a depressant effective amount of a cyclopropyl-1,2,4-oxadiazolyldiazine of the formula:



wherein Z is a trivalent radical selected from the group consisting of



the dotted line represents one double bond, the position being dependent upon the definition of Z; R is selected from the group consisting of pyrazinyl, pyridazinyl and pyrimidyl or a pharmaceutically acceptable salt thereof.

3,906,098
CERTAIN PYRIMIDINE COMPOUNDS USEFUL AGAINST PLANT PESTS

Charles Brian Barlow, Camberley; Brian Graham White, Crowthorne, and Clive Dudley Spencer Tomlin, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 29, 1972, Ser. No. 230,513

Claims priority, application United Kingdom, Mar. 19, 1971, 7289/71; Mar. 19, 1971, 7290/71; Mar. 19, 1971, 7293/71

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—251 **5 Claims**

2. A method of combatting insect, fungal and bacterial plant pests which comprises applying to said plants an pesticidally effective amount of a compound of the formula X—NH—Y wherein X is pyrimidinyl bearing two to three substituents; and Y represents phenyl, naphthyl, or pyridyl bearing at least one substituent; the substituents in each case selected from the group consisting of halogen, cyano, nitro, trifluoromethyl, lower alkoxy, lower alkylthio, benzylthio, lower alkyl and amino, provided that (a) said compound bears at least four substituents of which at least two are halogen atoms, and (b) where Y represents a pyridyl radical there is at least one substituent other than halogen present.

3,906,099
1,2,3,4-TETRA HYDRO-3-AMINOMETHYLISOQUINOLINES IN THE TREATMENT OF MENTAL DEPRESSION

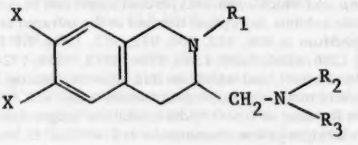
Glenn C. Morrison, Dover, and Wiaczeslaw A. Cetenko, Parsippany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 260,884, June 8, 1972, Pat. No. 3,836,536. This application June 21, 1974, Ser. No. 481,923

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—258 **6 Claims**

1. A method for treating mental depression which comprises oral or parenteral administering to a mammal from about 5 to about 200 mg/kg of body weight of a pharmaceutical composition containing a 1,2,3,4-Tetrahydro-3-aminomethylisoquinoline having the formula:



wherein R_1 is hydrogen, 1 to 6 carbon lower alkyl, or benzyl; R_2 is hydrogen, 1 to 6 carbon lower alkyl, phenyl, benzyl, alkoxy substituted benzyl wherein the alkoxy group has from 1 to 3 carbon atoms, pyridylmethyl, or guanyl; R_3 is hydrogen or 1 or 6 carbon lower alkyl; and X is hydrogen or 1 to 3 carbon lower alkoxy; and a nontoxic pharmaceutically acceptably salt thereof.

3,906,100
N-BENZYL-N-[2-PHENYL-2-(4-PHENYL-1-PIPERIDYL)-ETHYL]-PROPIONAMIDE PARA-CHLOROBENZENE SULFONATE

Herbert John Havera, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 363,425, May 24, 1973. This application Apr. 3, 1974, Ser. No. 457,456

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **1 Claim**

1. A method of suppressing narcotic abstinence symptoms in maintenance therapy of a narcotic addicted mammal comprising:

orally administering to said mammal an effective amount of N-benzyl-N-[2-phenyl-2-(4-phenyl-1-piperidyl)ethyl]-propionamide p-chlorobenzenesulfonate.

3,906,101
PHARMACEUTICAL COMPOSITIONS CONTAINING SUBSTITUTED 5-NITROFURFURYLIDENEAMINO-OXAZOLIDINONES

William Hoyle, Bramhall, and Michael Philip Savage, Heald Green, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

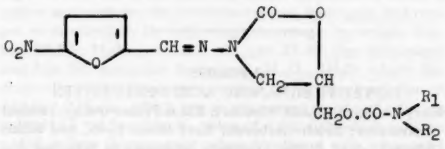
Division of Ser. No. 43,586, June 4, 1970, Pat. No. 3,686,170. This application June 15, 1972, Ser. No. 263,046

Claims priority, application United Kingdom, June 5, 1969, 28421/69

Int. Cl.[2] A61K *31/42*

U.S. Cl. 424—272 **3 Claims**

1. A pharmaceutical composition useful for treating bacteria comprising an antibacterially effective amount of a compound having the formula



wherein

R_1 is hydrogen or a group COR_3, wherein

R_3 is hydrogen, alkyl having at most six carbon atoms or alkenyl having from two to six carbon atoms, and

R_2 is hydrogen or alkyl having at most three or four carbon atoms, whereby at least one of the symbols

R_1 and R_2 is different from hydrogen, and a pharmaceutically acceptable carrier therefor.

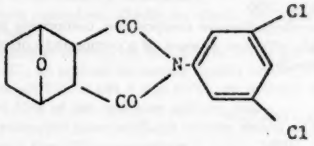
3,906,102

CERTAIN 3,5-DICHLOROPHENYL COMPOUND AS AN ANTIFUNGAL AGENT

Nobumasa Tottori; Yasuhisa Asano, both of Minoo; Minoru Ueda; Osamu Kirino, both of Takarazuka; Shigehiro Ooba, Kobe; Akira Fujinami, Ashiya, and Toshiaki Ozaki, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Nov. 1, 1973, Ser. No. 411,838
Claims priority, application Japan, Nov. 2, 1972, 47-109890
Int. Cl.[2] A01N 9/22
U.S. Cl. 424—274 6 Claims

1. A method for preventing plat diseases caused by phytopathogenic fungi selected from the group consisting of the genera Sclerotinia and Botrytis which comprises applying to said fungi a fungicidally effective amount of a 3,5-dichlorophenyl compound of the formula:



3,906,103

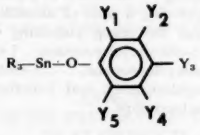
PESTICIDAL COMPOSITION AND METHOD

Bernard G. Kushlefsky, Edison, N.J., and Wendell K. Whitney, Midland, Mich., assignors to M & T Chemicals Inc., Greenwich, Conn. and The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 96,444, Sept. 9, 1970, abandoned, which is a division of Ser. No. 749,625, Aug. 2, 1968, Pat. No. 3,609,173. This application Mar. 14, 1974, Ser. No. 451,065
Int. Cl.[2] A01N 9/00
U.S. Cl. 424—288 2 Claims

1. A pesticidal composition for controlling mites and insects, the composition consisting essentially of

1. an inert carrier, and
2. a miticidally or insecticidally effective amount of a tricyclohexyltin compound of the formula



wherein R is cyclohexyl, Y_{1-5} are the same or different and Y is selected from the group consisting of 4- chloro-2-cyclopentyl, phenyl, chloro, cyano, methylmercapto, nitro and hydrogen, such that not more than four Y substituents are hydrogen.

3,906,104

INSECTICIDAL SULFONATES

Richard D. Partos, Brentwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 17,902, March 9, 1970, Pat. No. 3,818,102. This application Mar. 14, 1974, Ser. No. 450,960
Int. Cl.[2] A01N 9/14
U.S. Cl. 424—303 16 Claims

1. An insecticidal composition comprising a carrier and an insecticidally effective amount of 2,4-dinitrophenyl methane sulfonate.

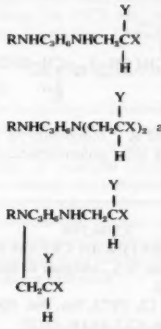
3,906,105

CYANOETHYL AND HALOETHYL DIAMINES AS BACTERICIDES AND FUNGICIDES

Joseph Matt, Chicago, and Manuel Slovinsky, Woodridge, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed June 10, 1974, Ser. No. 477,732
Int. Cl.[2] A01N 9/06, 9/20, 9/24
U.S. Cl. 424—304 9 Claims

1. A method of inhibiting the growth of bacteria and fungi by applying to an area infested therewith a bacterial or fungicidal effective amount of at least 0.1 ppm by weight of a mono or bis (2-cyanoethylated) or (2-haloethylated) long-chain diamine selected from at least one member of the group consisting of



where

X is uniformly halo or CN;

Y is H, or CH_3;

R is alkyl where the length of the carbon chain is from C_8—C_{18}.

3,906,106

MATERIAL FOR THE PHYSIOLOGICAL TREATMENT AND REFATTING OF HUMAN SKIN

Otto K. Jacobi, Wiesbaden, Germany, assignor to Kolmar Laboratories, Inc., Port Jervis, N.Y.

Filed Oct. 23, 1968, Ser. No. 770,116
Int. Cl.[2] A61K 31/23
U.S. Cl. 424—312 6 Claims

1. A composition for topical application, comprising a topical surface active material capable of substantially defatting human skin when applied to said skin, and having incorporated therein an ester of an aliphatic branch chain fatty alcohol and a hydroxy fatty acid, said alcohol containing from 8 to 20 carbon atoms in the molecule and said branch chain being an alkyl group containing from 1 to 4 carbon atoms, said acid containing from 5 to 20 carbon atoms, said ester acting to prevent the defatting action of said material and to substantially reduce the irritational effect of said material on said skin, said ester being present in an amount of 0.05 to 50 percent by weight of said material.

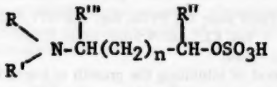
3,906,107

AMINOALKYL SULFATE ESTERS WITH DIURETIC ACTIVITY

Pitambar Somani, Libertyville, and Donald Lyons Martin, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

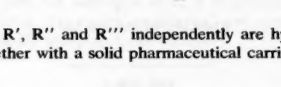
Filed Sept. 8, 1972, Ser. No. 287,304
Int. Cl.² A61K *31/185*
U.S. Cl. 424—315 10 Claims

1. The process of increasing urinary excretion in warm-blooded animals in need thereof consisting essentially in administering to said animal a therapeutically effective dose of a compound of the formula



wherein R, R′, R″ and R‴ independently are hydrogen or methyl and *n* is 0, 1 or 2.

9. A medicinal composition in dosage unit form designed to increase urinary excretion consisting essentially of a pharmaceutically effective amount of a compound of the formula



wherein R, R′, R″ and R‴ independently are hydrogen or methyl together with a solid pharmaceutical carrier and *n* is 0–2.

3,906,108

STABILIZED TRETINOIN CREAM EMULSION

Lanny G. Felty, Jackson, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 12, 1973, Ser. No. 406,126
Int. Cl.² A61K *31/20*
U.S. Cl. 424—318 7 Claims

1. In a tretinoin cream emulsion for topical application comprising from about 0.005 to about 0.5% by weight of tretinoin, from about 1.0 to about 10.0% by weight of an emulsifier, from about 15.0 to about 50.0% by weight of a hydrophobic material selected from the group consisting of petrolatum, beeswax, sperm wax, lanolin, mineral oil, the liquid and solid fatty acids having from about 12 to about 20 carbon atoms, fatty alcohols having from about 12 to about 20 carbon atoms, and fatty acid esters wherein the fatty acid moiety has from about 12 to about 20 carbon atoms, from about 0.05 to about 1.0% by weight of a preservative, from about 0.01 to about 1.0% by weight of an antioxidant, and water, the improvement which comprises also having therein as a stabilizer to prevent breaking of the emulsion, from about 0.1 to about 1.0% by weight of xanthan gum.

3,906,109

BLOOD CLOTTING DEPRESSANT THERAPY

Dan Christian Roehm, 808 N.E. 20th Ave., Ft. Lauderdale, Fla. 33304

Continuation-in-part of Ser. No. 224,964, Feb. 9, 1972, Pat. No. 3,892,865. This application Sept. 26, 1972, Ser. No. 292,404The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.
Int. Cl. A61k *27/00*
U.S. Cl. 424—325 9 Claims

1. A method of depressing the coagulation activity of blood in an animal host which is in need of said coagulation depression comprising administering an effective coagulation depressing amount of a composition to animals in such a fasting state that the animal host has not had a substantial food intake within 2 hours before or 1 hour after the administration of the composition, whereby the lipid content of the blood drops below the preadministration content, said substantial food intake being at least the equivalent of 400 calories and 2 ounces of fat and said composition consisting essentially of diethanolamine or the pharmaceutically-acceptable non-toxic salts thereof.

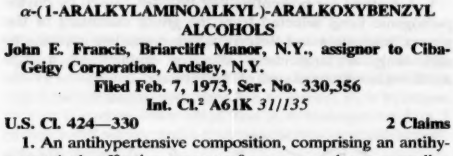
3,906,110

ANTIHYPERTENSIVE α-(1-ARALKYLAMINOALKYL)-ARALKOXYBENZYL ALCOHOLS

John E. Francis, Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1973, Ser. No. 330,356
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 2 Claims

1. An antihypertensive composition, comprising an antihypertensively effective amount of a compound corresponding to the formula



wherein R is hydrogen, lower alkyl, lower alkoxy, halogeno or trifluoromethyl and each of *m*, *n* and *p* is the integer 1 or 2, or a therapeutically useful acid addition salt thereof, together with a pharmaceutical excipient suitable for oral application.

3,906,111

HALOGENATED METHYLCYCLOPROPYL ETHERS FOR INDUCING A STATE OF ANESTHESIA

Charles Alden Billings, Concord; Gerald Joseph O'Neill, Arlington, and Charles William Simons, Bedford, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Mar. 15, 1974, Ser. No. 451,677
Int. Cl.² A61K *31/08*
U.S. Cl. 424—342 5 Claims

1. The process for inducing a state of anesthesia which comprises administering by inhalation to a mammal an effective quantity, for inducing a state of anesthesia, of a compound selected from the group consisting of 1-methoxy-1,2,2,3-tetrafluoro-3-chlorocyclopropane, 1-methoxy-1,2,3-trifluoro-2,3-dichlorocyclopropane, 1-methoxy-1,2,2-trifluoro-3,3-dichlorocyclopropane and 1-methoxy-1,2,2,3-tetrafluoro-3-bromocyclopropane.

3,906,112

EXTRACTION OF CAROTENOID PIGMENT FROM SHRIMP PROCESSING WASTE

Lyle K. Anderson, Warrenton, Oreg., assignor to Bioproducts Incorporated, Warrenton, Oreg.

Filed Sept. 16, 1974, Ser. No. 506,280
Int. Cl.² A23L *1/27*
U.S. Cl. 426—1 9 Claims

1. A method for preparing a carotenoid pigment extract of crustacean shell waste, comprising

preparing from said waste a watery mixture comprising finely divided portions of said waste, which portions contain said pigment,

incorporating an oil in said mixture to produce an aqueous dispersion containing said oil as a dispersed phase, and

separating from said dispersion the oil phase thereof, which phase contains the pigment extract.

3,906,113
NEW AMYLASE AND ITS PREPARATION BY FERMENTATION OF A PENICILLIUM

Andre Belloc, Vanves; Jean Florent, Paris; Denise Mancy, Charenton, and Jean Verrier, Boulogne-sur-Seine, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Feb. 20, 1973, Ser. No. 333,489

Claims priority, application France, Feb. 23, 1972, 72.06107

Int. Cl.² C12d *13/10*; **A21d** *8/04*

U.S. Cl. 426—64 **10 Claims**

1. The enzyme 27591 RP, which is:
   a. a protein;
   b. soluble in water, sparingly soluble in concentrated aqueous solutions of neutral salts and of alcohols and ketones which are miscible with water and insoluble in such anhydrous alcohols and ketones;
   c. it retains 80% of its original activity after 6 months at 4°C., in the absence of moisture;
   d. it exerts α-amylase activity on starch, glycogen and limit dextrins;
   e. its optimum activity on starch is at about pH 4 at 55°C; at 25°C., its activity decreases rapidly below pH 4.0 and above pH 7.0; at pH 4 and 65°C., its activity represents about 50% of the optimum activity; and
   f. it is extracted from artificial culture media of the strain denoted *Penicillium expansum* F 1046 (NRRL 5437).

3,906,114
SOLIDIFIED PRODUCT FROM HIGH FRUCTOSE CORN SYRUP AND PROCESS

Elmer F. Glabe, Chicago; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Continuation of Ser. No. 286,568, Sept. 5, 1972, Pat. No. 3,383,413. This application Mar. 28, 1974, Ser. No. 455,607The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² A23L *1/09*, *1/08*, *1/20*

U.S. Cl. 426—641 **9 Claims**

1. A process for dehydrating high fructose corn syrup which comprises intimately mixing said syrup with an at least partially defatted soy protein to form a slurry, and subsequently subjecting said slurry in a thin film to a heated surface for a period of time sufficient to dehydrate said slurry, the quantity of said soy protein being sufficient to enhance the crispness of said film, the protein content of said soy protein being at least 45% by weight, the water soluble protein content being at least 20% by weight of the total protein content, and the weight ratio of water soluble protein to fat content being at least 1.5:1.

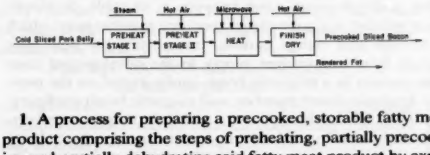
3,906,115
METHOD FOR THE PREPARATION OF PRECOOKED MEAT PRODUCTS

Morris R. Jeppson, Box 4943, Carmel, Calif. 93921

Continuation-in-part of Ser. No. 262,636, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 106,641, Jan. 15, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,086

Int. Cl.² A23L *1/31*

U.S. Cl. 426—243 **10 Claims**



1. A process for preparing a precooked, storable fatty meat product comprising the steps of preheating, partially precooking and partially dehydrating said fatty meat product by exposure to steam at a temperature of from about 212°F to about 350°F for a period of time sufficient to render a substantial portion of the fat content of said meat product, said period of time being sufficient to heat said meat product to a temperature of at least 160°F to produce a weight reduction in said meat product of at least about 10% of the initial weight thereof through release of rendered water containing fat therefrom, exposing said steam-treated meat product to microwave energy for a period sufficient to accomplish further cooking thereof, exposing said meat product to a hot substantially non-aqueous gas subsequent to exposure of said product to said steam and before, during, or after said exposing to microwave energy for a period sufficient to further cook and further dehydrate the surface regions thereof, and removing rendered fat from said meat product during said steam exposure and said microwave irradiation thereof.

3,906,116
CONCENTRATED OLEORESIN PRODUCTS AND EMULSIFICATION PROCESS FOR PREPARING THEM

Peter Gregory Quesnel, London; Andreas Lambrou, Kelvedon, and Edwin Stanley Walker, Romford, all of England, assignors to Bush Boake Allen Ltd., London, England

Filed Sept. 24, 1973, Ser. No. 400,169

Claims priority, application United Kingdom, Sept. 25, 1972, 44220/72

Int. Cl.² A23L *1/26*

U.S. Cl. 426—602 **22 Claims**

1. A process for preparing an aqueous emulsion of a flavour oleoresin which process comprises forming, an oleoresin solution or collodial solution (a) of the oleoresin in a diluent; mixing said solution or colloidal solution (a) with agitation with a preformed mixture (b) comprising an emulsion stabiliser, and at least one oil selected from the group consisting of edible oils and essential oils; adding an aqueous solution or dispersion (c), of an emulsion stabiliser to form a final mixture (d), and emulsifying said final mixture (d) to form an aqueous emulsion of said flavor oleoresin.

3,906,117
HYDRATED PAN RELEASE AGENTS

Ilija Gawrilow, Brookpark, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,127

Int. Cl.² A23D *5/00*

U.S. Cl. 426—420 **2 Claims**

1. A method of treating baking pans to prevent adhesion of a baked product to the baking pan surface, comprising:
   providing a pan release agent of a fluid, stabilized glyceride mixture containing between about 4 to 14 weight parts of soft mono- and diglycerides having an Iodine value of at least about 40, 2 to 8 weight parts of ethoxylated monoglyceride, up to 8 weight parts of solid stearine, and between about 40 to 100 weight parts of liquid vegetable oils; heating to form a molten mixture; rapidly cooling said molten mixture to a temperature of at least 85°F to initiate Beta crystal formation and produce a chilled blend having dispersed fat crystals; working said chilled blend at temperatures between 82° to 88°F to develop Beta crystal formation and produce a substantially uniform dispersion wherein the fat crystals are in equilibrium with said liquid vegetable oil; fluidizing said uniform dispersion by agitating at temperatures of 80° to 90°F for time sufficient to complete beta crystal formation;
   hydrating said pan release agent to provide a stabilized oil-in-water emulsion containing between about 30% to 70% by weight of water; and
   applying said hydrated pan release agent to the baking surface of said baking pan.

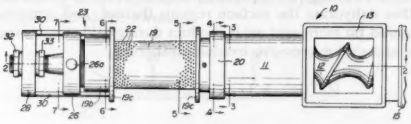
3,906,118
PROCESS FOR DE-BONING MEAT OR FISH

Archie Rae McFarland, Salt Lake City, Utah, assignor to Beehive Machinery Inc., Sandy, Utah

Continuation of Ser. No. 881,686, Dec. 3, 1969, Pat. No. 3,739,994, which is a continuation-in-part of Ser. No. 593,532, Nov. 10, 1966, abandoned. This application June 8, 1973, Ser. No. 368,190

Int. Cl.[2] A23L *1/31, 1/325*

U.S. Cl. 426—479 **4 Claims**



1. A process for de-boning ground meat or fish material containing soft fleshy matter and boney components, comprising the steps of introducing under pressure such a material into the feed end of a perforated de-boning conduit of circular cross-section and open for discharge of material at the opposite end, said conduit containing a rotary compression screw extending along its length and through the open discharge end thereof; conveying said material toward said discharge end of the conduit by means of said screw while maintaining said pressure, so as to compress said material within said conduit, whereby boney components are retained in and passed along said conduit as a filter mat through which soft fleshy matter is forced toward and expelled through the perforations of the conduit; selectively restricting said flow from the discharge end of the conduit circumferentially of and around the discharge end of said screw to increase the pressure within said conduit; and positively passing said filter mat through said open discharge end of said conduit circumferentially of and by means of said discharge end of the screw for discharge from the conduit.

3,906,119
FLAVORING METHODS AND COMPOSITIONS

Alan O. Pittet, Atlantic Highlands; John V. Pascale, Jackson, and Denis E. Hruza, Bricktown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 201,545, Nov. 23, 1971, abandoned. This application May 23, 1973, Ser. No. 362,886

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—535 **4 Claims**

1. A process for altering the flavor of a foodstuff which comprises adding thereto an amount of from about 0.05 to 150 parts per million of at least one sulfinate selected from the group consisting of allyl propane sulfinate, benzyl propane sulfinate, and cyclopentyl propane sulfinate.

3,906,120
METHOD FOR PREPARING SLIDES FOR BLOOD EVALUATION

John A. Geating, Abington, Pa., assignor to General Electric Company, Fairfield, Conn.

Continuation-in-part of Ser. No. 222,654, Feb. 1, 1972, Pat. No. 3,796,594, which is a continuation-in-part of Ser. No. 85,817, Oct. 3, 1970, abandoned. This application May 24, 1973, Ser. No. 363,745

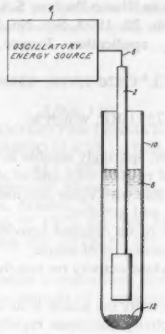
Int. Cl.[2] A01G *5/06;* **A01N** *1/00, 3/00*

U.S. Cl. 427—4 **11 Claims**

1. The method of providing a glass microscopic slide with a coating of dried stain suitable for differentially staining components of blood applied thereto as a liquid film, which comprises:

a. immersing in water an excess of a dye selected from the group consisting of (1) methylene azure and methylene blue NN, (2) methylene blue NN, (3) cresyl violet acetate or (4) toluidine blue O;

b. dissolving the dye in the water by applying sonic energy mechanically thereto;



c. removing residual solids from the resulting solution;

d. adding to the solution a quantity of surfactant to reduce the surface tension of the solution;

e. applying the solution containing surfactant to the surface of a glass microscopic slide to form a thin film of solution thereon;

f. allowing the thin film of solution to dry.

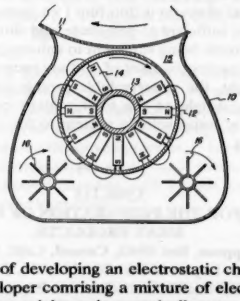
3,906,121
ELECTROSTATIC DEVELOPMENT METHOD USING MAGNETIC BRUSH CONFIGURATION TRANSPORT

Lawrence J. Fraser, and Delmer G. Parker, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 146,704, May 25, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,497

Int. Cl.[2] G03G *13/08, 15/08*

U.S. Cl. 427—18 **12 Claims**



1. A method of developing an electrostatic charge pattern with a dry developer comrising a mixture of electrostatically attractable toner particles and magnetically attractable carrier particles, said carrier particles and said toner particles having a triboelectric relationship of opposite polarity and said toner particles being charged to a polarity opposite that of the charge pattern to be developed, said method comprising providing a development zone between a movable developer donor member and a developer receiving member upon which to develop said charge pattern, transporting the developer mixture from a developer supply to the development zone while present in a magnetic brush configuration on the movable developer donor member, said magnetic brush configuration being formed by stationary multipole magnet members, each member being affixed to generate an opposite polarity with respect to an adjacent magnetic pole member, transporting said developer while on said movable donor member

through the development zone in which the magnetic field in the development zone is insufficient to maintain the developer in a brush configuration, said developer mixture being in substantially uniform brushless, blanket contact with said developer receiving member in said development zone, and terminating contact between said developer receiving member and said brushless blanket of developer following development.

3,906,122
METHOD FOR COATING METAL ANODES WITH ELECTROCONDUCTIVE PAINT

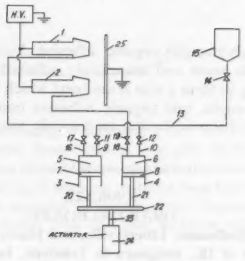
Janusz Josef Henryk Krause, and David Alan Denton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 24, 1974, Ser. No. 436,349

Claims priority, application United Kingdom, Feb. 2, 1973, 5237/73

Int. Cl.² B05B *5/00*

U.S. Cl. 427—33 **13 Claims**



1. A method of coating metal anodes with electroconductive paint comprising the steps of

a. providing an electrostatic spray gun at a high electrical potential,

b. providing a cylinder containing a predetermined volume of electroconductive paint, said volume of paint in said cylinder being large enough to coat an entire continuous surface of a metal anode to be coated,

c. placing a continuous surface of a metal anode to be coated in position to receive electroconductive paint from said spray gun,

d. ensuring that said metal anode to be coated is at ground potential,

e. positively delivering electroconductive paint from said cylinder to said spray gun at a continuous non-pulsating rate by the single displacement stroke of a piston in said cylinder, and

f. spraying said delivered electroconductive paint from said spray gun onto said anode surface at said continuous non-pulsating rate thereby providing delivery of a sufficient volume of electroconductive paint from said cylinder to said continuous metal anode surface to completely and uniformly coat said surface.

3,906,123
SELF-CONTAINED PRESSURE-SENSITIVE SYSTEM

David N. Vincent, Glenview, and Ronald R. Golden, Mt. Prospect, both of Ill., assignors to Champion International Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,810

Int. Cl.² B41M *5/00*

U.S. Cl. 427—145 **22 Claims**

1. Pressure-sensitive record material comprising a support carrying, in order,

a first layer comprising microscopic pressure-rupturable capsules on the surface of said support, said capsules containing a substantially colorless, color-reactant material:

a second layer adjacent said first layer comprising a continuous, non-permeable, pressure-rupturable, water-insoluble, polymeric barrier layer, said barrier layer being rupturable under localized pressures at an ambient temperature in the range of 20°–25°C.

a third layer adjacent said second layer comprising an adsorbent, electron-acceptor material;

said color-reactant material and said electron-acceptor material being capable of reacting to form a distinctive color upon contact.

9. A method for the production of a pressure-sensitive record system which comprises, providng a substrate, applying a first coating composition to the surface of said substrate, said first coating composition comprising a dispersion of microscopic capsules, each capsule containing a colorless, color-reactant material, applying a second coating composition over said first coating, said second coating composition comprising an aqueous solution of a polymeric material, said polymeric material being capable of providing a continuous non-permeable pressure-rupturable, water-insoluble barrier layer, and applying a third coating composition over said second coating comprising an aqueous dispersion of an adsorbent, electron-acceptor material, said color-reactant material and said electron-acceptor material being capable of reacting to form a distinctive colored mark upon contact, said barrier layer being rupturable under localized pressures at an ambient temperature in the range of 20°–25°C.

3,906,124
METHOD OF APPLYING VITREOUS ENAMEL GROUND COAT

George Francis Carini; Ernest Mayer Hommel, both of Pittsburgh, and James Raymond Twigger, Houston, all of Pa., assignors to The O. Hommel Company, Pittsburgh, Pa.

Division of Ser. No. 290,221, Sept. 18, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,911

Int. Cl.² C23D *5/00*

U.S. Cl. 427—309 **1 Claim**

1. A method of applying vitreous enamel ground coat to a ferrous metal substrate comprising the steps for:

1. pickling and nickel flashing the metal substate;

2. preparing a batch consisting essentially of 100 parts of a frit analyzing up to 18% by weight Na_2O, up to 3% K_2O, up to 10% Li_2O, up to 6% Al_2O_3, 15 to 25% B_2O_3, 30 to 60% SiO_2, 1 to 10% F_2, 1 to 20% BaO, up to 15% CaO, up to 1% MgO, up to 4% ZnO, up to 2% P_2O_5, up to 5% $ZrO_2$and incidental impurity oxides and said batch further consisting of mill additions of slip forming ingredients;

3. milling the ingredients with a vehicle to form a suitable slip;

4. applying the slip to the substrate treated in step 1 to form a coating;

5. drying and firing the coating at a temperature between 1,100° and 1,600°F; and

6. recovering a substrate with a satisfactory enamel ground coat.

3,906,125
PROCESS OF TREATING SHEET STEEL

Joseph F. Uher, Timonium, Md., assignor to SCM Corporation, Cleveland, Ohio

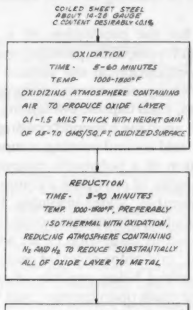
Continuation-in-part of Ser. No. 61,380, Aug. 5, 1970, abandoned. This application Mar. 14, 1973, Ser. No. 341,259

Int. Cl.² C23D *3/00*

U.S. Cl. 427—330 **4 Claims**

1. A method of treating an open coil of sheet steel prior to coating said sheet steel with a porcelain enamel coating, said sheet steel having a thickness in the range from about 14 gauge to about 28 gauge and having a carbon content below about 0.1% by weight, which comprises subjecting said coil of sheet steel to oxidation in contact with air at a temperature in

the range 1000°–1500°F. for a period of time sufficient to produce on the surface of said sheet steel exposed to the air an oxide layer having a thickness in the range from about 0.1 to about 1.5 mils, the resulting oxidized coil of sheet steel exhibiting a gain in weight in the range from about 0.5 to about 7.0 grams per square foot of surface exposed to the air, subjecting the oxidized coil of sheet steel to a reducing atmosphere consisting essentially of nitrogen and hydrogen at a temperature in the range from about 1000°F. to about 1500°F.



to reduce all of the oxide layer to metal, the aforesaid operations being followed by a decarburizing operation at a temperature in the range 1000°–1500°F. in an atmosphere consisting essentially of nitrogen, hydrogen and water vapor to produce a resulting treated coil of sheet steel having a carbon content below about 0.01% by weight, subjecting said resulting treated coil of sheet steel to cold rolling to at least about 0.5% elongation to effect tempering of the sheet steel and coating the resulting tempered sheet steel with a coating of ceramic frit dispersed in a cured fugitive organic binder.

3,906,126
CAN BODY

Edward William Kaiser, Arlington Heights, and Kenneth Richard Rentmeester, Barrington, both of Ill., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 202,096, Nov. 26, 1971, Pat. No. 3,773,589, which is a continuation of Ser. No. 830,918, May 22, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,211, Sept. 29, 1965, abandoned. This application May 10, 1973, Ser. No. 358,842

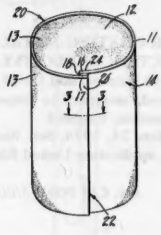
Int. Cl.² B65D *7/12*; **B32B** *15/08, 27/34, 27/38*

U.S. Cl. 428—36 **3 Claims**

1. A tubular sheet metal can body having its opposed longitudinal edges overlapped to form a side seam, comprising:

an organic coating tenaciously adhered to at least one of the opposed surfaces of said sheet metal included within said lap side seam, said organic coating comprising the reaction product of

1. a polyvinyl acetal resin containing from 6% to 22% polyvinyl alcohol and selected from the group consisting of polyvinyl formal, polyvinyl acetal, polyvinyl butyral, and mixtures thereof,
2. a resinous glycidyl polyether having glyceryl groups united with the divalent residue of a polyhydric phenol through ether oxygen atoms, having terminal glycidyl groups providing an epoxide equivalent of from 425 to 6,000 and having a number average molecular weight of from 1,000 to 4,000,
3. an alkenyl ether of a polymethylol phenol, and
4. an amine phosphate acid addition salt selected from the group consisting of mono(dibutylamine) pyrophosphate, triethylamine metaphosphate, tertiary-octylamine metaphosphate, laurylamine metaphosphate, allylamine metaphosphate, triamylamine pyrophosphate, dicyclohexylamine metaphosphate, and mixtures thereof;



and a high-strength organic adhesive disposed within said lap side seam and tenaciously adhered to said organic coating to form a side seam bond which has a high bursting strength, said organic adhesive comprising a linear superpolyamide having an intrinsic viscosity of at least 0.4

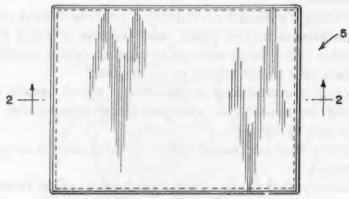
3,906,127
DRAWING BOARD

Walter G. Hollmann, Libertyville, and Harry O. Newlin, Skokie, both of Ill., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Sept. 10, 1973, Ser. No. 395,593

Int. Cl.² B32B *3/12*

U.S. Cl. 428—73 **2 Claims**



1. A lightweight, dimensionally stable, non-wood drawing board comprising an inner core of uniform thickness formed of resin-impregnated corrugated paper honeycomb, top and bottom facing sheets laminated to the opposite faces of said inner core and formed of smooth moisture resistant preformed sheets of high impact polystyrene and an outer aluminum frame of U-shaped cross section extending completely around said inner core with the spaced legs of said frame extending inwardly toward said inner core and with the bight portion of said frame forming the continuous outermost side edge of the drawing board and with portions only of the top and bottom surfaces of the frame legs adjacent their distal ends being flush and contiguous with the top and bottom surfaces, respectively, of said inner core, the margins of said top and bottom facing sheets overlapping onto said flush top and bottom surface portions, respectively, of said frame legs and being adhered thereto so as to thereby seal said inner core in the envelope formed by said facing sheets and frame, the peripheral edges of said top and bottom facing sheets abutting continuous shoulders formed in the top and bottom surfaces,

respectively, of said legs at the junctures of said flush surface portions and the remaining non-flush surface portions.

3,906,128

PACKAGING WITH INTERNAL PILE SURFACES

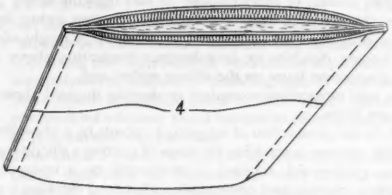
Eric Douglas Burling, Cheadle Hulme, and Margaret Lilian Steel, Runcorn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 259,609, June 5, 1972, abandoned. This application July 22, 1974, Ser. No. 491,479

Claims priority, application United Kingdom, June 9, 1971, 19670/71; Dec. 8, 1971, 56945/71

Int. Cl.² D03D *27/00;* **D04H** *11/00*

U.S. Cl. 428—86 **3 Claims**



1. Laminar packaging comprising a first layer consisting of a backing material heat bonded to a pile of thermoplastic material by means of said thermoplastic laminated to a second layer also consisting of backing material heat bonded to a pile of thermoplastic material by means of said thermoplastic said layers being bonded with the pile surfaces adjacent each other.

3,906,129

REMOVABLE INSULATING COVER FOR GENERALLY CYLINDRICAL CONTAINERS

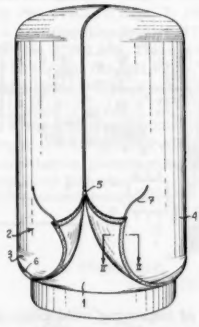
Pierre Damois, Le Havre, France, assignor to Etablissements Damois Freres, Le Havre, France

Filed Mar. 6, 1974, Ser. No. 448,450

Claims priority, application France, July 12, 1973, 73.25617

Int. Cl.² B32B *5/18, 7/08;* **B65D** *65/02*

U.S. Cl. 428—99 **4 Claims**



1. An insulating cover for a generally cylindrically shaped container, said cover having a sidewall which converges to define a closed hood, said sidewall further defining an aperture disposed oppositely of said hood, said cover comprising:

a first cover section, said first cover section including:

a sheet of a first flexible material having a preselected degree of elasticity;

a layer of a first flexible insulating material, said first insulating material being of a different material when compared to said first flexible material; and

a layer of closed cell expanded polyurethane sandwiched between said sheet and layer of first insulating material;

a second cover section, said second cover section being separable from said first section and including:

a sheet of said first flexible material;

a layer of said first flexible insulating material; and

a layer of closed cell expanded polyurethane sandwiched between said sheet and layer of first insulating material; said second cover section having substantially the same size and shape as said first cover section; and

zipper means for joining said first and second cover sections along an axial medium plane through the container, said zipper means permitting separation of said cover sections.

3,906,130

NON-WOVEN AND PERFORATED TEXTILE FABRICS MADE FROM CONTINUOUS SYNTHETIC FIBER, AND A PROCESS FOR THE MANUFACTURE OF SAME

Takashi Tsurumi; Shuichi Emori; Kiyokazu Daigoh; Takemi Ikegami, and Tutomu Kaneko, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 24, 1973, Ser. No. 382,217

Claims priority, application Japan, July 25, 1972, 47-74320

Int. Cl.² D04H *3/05, 3/14*

U.S. Cl. 428—131 **2 Claims**

1. A perforated non-woven textile web made from continuously extruded filaments produced by a wet spinning process, wherein the web consists essentially of alternately arranged continuous filaments of relatively linear portions (A) which are physically cross-linked to each other without the use of bonding agents at various portions along the length of said filaments to form a latticework structure, said filaments also have finely folded portions (B), wherein the finely folded portions are evenly distributed over the entire area of the web, the web having regularly arranged projections and perforations such that the filament portions (A) and (B) are entangled with each other at each of the projections to fix and reinforce the latticework structure, the web having an arrangement such that the web represents an infinite number of projections distributed geometrically over the whole surface of the web and the filaments being united with each other at these projections.

3,906,131

CHAMOIS LEATHER-LIKE MATERIAL HAVING IMPROVED WATER ABSORBENCY AND ABRASION RESISTANCE

Hans Böe, Augsburg, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Continuation-in-part of Ser. No. 71,233, Sept. 10, 1970, abandoned, which is a division of Ser. No. 853,198, Aug. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 800,043, Feb. 13, 1969, abandoned, and Ser. No. 513,524, Dec. 13, 1965, abandoned. This application May 30, 1973, Ser. No. 365,362

Claims priority, application Germany, Dec. 31, 1964, 448498

Int. Cl.² B44D *1/44*

U.S. Cl. 428—151 **15 Claims**

1. A synthetic chamois leather-like material having an excellent abrasion and pilling resistance and good water retention capacity, which synthetic chamois leather-like material consists essentially of a non-woven textile fabric having la-

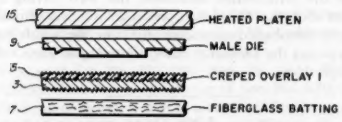
mella bonded adjacent fibers in the interstices thereof, coagulated, porous, absorbent, discontinuous rubber particles on both major surfaces thereof, said material having a surface which is substantially free of fibers, said material having an inner region which is substantially free of said coagulated, porous, discontinuous rubber particles, said porous, coagulated, discontinuous rubber particles in the form of beads positioned at or about one or more surface fiber ends, said synthetic chamois leather-like material capable of absorbing an amount of water according to U.S. Army KK-C-300 C test equivalent to at least 180% of its own weight.

8. In a process for preparing a repeatedly water-absorbable and abrasion-resistant synthetic chamois leather-like material which process comprises forming a fleece with an at least partially dryable liquid form bonding agent composition for the fibers thereof; at least partially drying the impregnated fleece, whereby depositing said bonding agent in the interstices of said fleece joining intersecting fibers with lamella and setting up said bonding agent to an extent sufficient to substantially maintain the dimensional integrity of said fleece, the improvement for increasing pill resistance and water adsorption of the resultant synthetic chamois leather-like material which comprises thereafter applying to both major surfaces of said non-woven fabric a coagulatable latex and effecting coagulation thereof on said surfaces while concentrating the so-formed coagulated discontinuous particles so that no such particles are formed within an inner 60% thickness region, said inner thickness region defined as the region which commences inwardly from the outer surface of said fabric a distance which equals 20% of the total thickness of said fabric and terminates from the opposite side thereof a distance equal to 20% of the total thickness of said fabric.

3,906,132
PREFINISHED OVERLAY PAPER

Wyman F. Uhl, Sterling, Mass., assignor to Litton Business Systems, Inc., Fitchburg, Mass.

Filed Sept. 10, 1973, Ser. No. 395,726
Int. Cl.[2] B32B *3/20*
U.S. Cl. 428—152 **2 Claims**



1. A process for forming a ceiling tile comprising:

a. impregnating glass fibers batting with a thermosetting phenolic resin,

b. placing acrylic coated, X creped paper overlay sheet over said batting with said coating being exposed, the coating containing an opacifying pigment, about 5 to 50 parts by weight of colloidal silica and an acrylic binder,

c. applying heat and pressure to adhere said overlay sheet to said batting and to form said overlay and batting into a contour of desired shape.

3,906,133
NITROCELLULOSE PROTECTIVE COATING ON MASKS USED IN IC MANUFACTURE

Richard E. Flutie, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Apr. 23, 1974, Ser. No. 463,311
Int. Cl.[2] G03C *5/00*
U.S. Cl. 428—172 **16 Claims**

1. In a combination useful in the production of integrated circuits by a photolithographic process;

a silicon wafer;

a photoresist coating on said wafer, said wafer having dendrites or protuberances projecting above the photoresist surface;

a photomask comprising a transparent substrate member having a hard masking layer thereon;

a thin coating of nitrocellulose on said masking layer;

the thickness of said nitrocellulose coating being from slightly less to at least slightly more than the height of the longest dendrite or protuberance projecting above the photoresist layer on the silicon wafer; and

the said nitrocellulose coating contacting the said photoresist layer.

12. In the production of integrated circuits by a photolithographic process comprising the steps of coating a silicon wafer with a photoresist, forming a photomask on a transparent substrate, coating said photomask with a hard masking layer, and placing said photoresist in juxtaposition with said hard masking layer; the improvement which comprises:

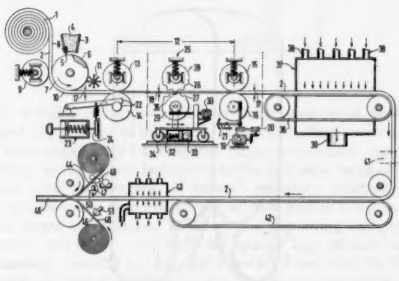
coating the masking layer with a thin layer of nitrocellulose having a thickness of from slightly less to at least slightly more than the height of dendrites or protuberances on the silicon wafer projecting above the photoresist; and

placing the photoresist layer in direct contact with said layer of nitrocellulose on the masking layer, whereby scratching of the masking layer is substantially prevented.

3,906,134
WELDABILITY OF ARTICLES MADE FROM PLASTIC FOAMS

Gerhard Pohl, Professorenweg, 33, 63 Giessen 1, Germany

Filed Apr. 3, 1972, Ser. No. 240,656
Claims priority, application Germany, Apr. 2, 1971, 2116092; May 13, 1971, 2123845The portion of the term of this patent subsequent to May 23, 1990, has been disclaimed.
Int. Cl.[2] B32B *7/14, 33/00*
U.S. Cl. 428—206 **16 Claims**



1. A process of improving weldability of a flexible foam article in which the foam structure contains at least some open cells which comprises distorting such article and bringing it into contact with a welding aid while it is in a distorted condition, said welding aid being in the form of discrete particles which can enter said open cells and which enhance the weldability of the resultant article, and said welding aid being a thermoplastic organic polymer having a lower limit for the melting point or softening range of at least 90°C. and an upper

limit below that at which said foam article is damaged when welded to another article.

3,906,135

WATER RESISTANT ADHESIVE

Lawrence Krutzel, Brooklyn, N.Y., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 28, 1971, Ser. No. 148,242
Int. Cl.² C08L 23/08, 29/04
U.S. Cl. 428—246 11 Claims

1. An adhesive composition consisting essentially of

A. an aqueous vinyl acetate-ethylene copolymer emulsion containing polyvinyl alcohol, wherein the copolymer is an interpolymer of additively combined units of vinyl acetate and ethylene containing about 20 to 50 weight percent of polymerized ethylene and a balance consisting essentially of polymerized vinyl acetate,

B. from about 0.5 to 3.5 moles of a monocarboxylic acid per molar equivalent of polymerized vinyl alcohol in the emulsion, the monocarboxylic acid being selected from the group consisting essentially of alkanoic acids and monocyclic aromatic acids each having up to 10 carbon atoms,

C. from about 35 to 70 percent, based on the weight of the emulsion of water, and

D. an acidic curing catalyst other than the monocarboxylic acid of (B) in an amount sufficient to provide the composition with a pH of about 1.5 to 4.0.

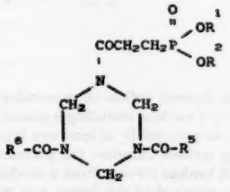
3,906,136

PROCESS OF FLAME RETARDING SUBSTRATES BY APPLYING HEXAHYDRATRIAZINE PHOSPHONATE DERIVATIVES

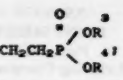
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 178,417, Sept. 7, 1971, Pat. No. 3,849,409, which is a continuation-in-part of Ser. No. 139,222, April 30, 1971, Pat. No. 3,762,865. This application Aug. 30, 1974, Ser. No. 501,928
Int. Cl.² B05D 3/06; D06M 15/12; C09K 3/28
U.S. Cl. 428—262 13 Claims

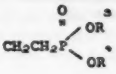
1. A process for flame retarding flammable solid substrates comprising applying to the substrate an effective amount of at least one hexahydrotriazine phosphonate derivative corresponding to the structural formula:



wherein R^5 and R^6 are the same or different radicals and are selected from the group consisting of —CH=CH_2 and



and wherein R^1, R^2, R^3 and R^4 are the same or different and are radicals selected from the group consisting of alkyl, cycloalkyl, alkenyl, alkylene, aryl, and arylalkyl; said R^1, R^2, R^3 and R^4 radicals having from 1 to about 20 carbon atoms and either unsubstituted or substituted by non-interfering substituents selected from the group consisting of halogen, alkoxy and hydroxy, wherein the terminal valency of any such alkylene radical is linked to the same or another phosphonate molecule conforming to the above formula with the proviso that when R^5 and R^6 are both



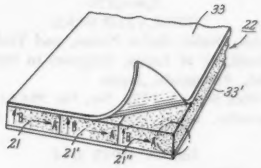
at least one of R^1, R^2, R^3 and R^4 is alkenyl; and thereafter curing said phosphonate so as to form an insoluble, fire retardant resin in and/or on said substrate.

3,906,137

LAMINATE HAVING A COMPRESSED FOAM CORE

Peter Bauer, Darmstadt, Germany, assignor to Rohm GmbH, Darmstadt, Germany

Continuation of Ser. No. 233,243, March 9, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,022
Claims priority, application Germany, Mar. 25, 1971, 2114524
Int. Cl.² B32B 3/26; B29D 27/00; B32B 31/04
U.S. Cl. 428—315 3 Claims



1. The method of making a laminar element which comprises uniformly compressing a body of thermoelastic polyvinyl chloride, polymethylmethacrylate, or polymethacrylimide foam of predetermined thickness in a first predetermined compression direction throughout its entire thickness while in a thermoelastic condition and maintaining the compressive pressure while cooling below the softening point, whereby the strength properties of the compressed foam are anisotropically improved in a direction perpendicular to the compression direction; positioning a plurality of such compressed sheets in superimposed relation to one another, the compression directions thereof being perpendicular to the faces of the sheet; forming a foam laminate from said superimposed sheets with the compression directions of the sheets being located perpendicular to the faces of the resulting foam laminate; separating a slab from said foam laminate in a direction perpendicular to the direction of compression; and then incorporating said slab between two loadbearing cover layers with the compression directions of said sheets being located parallel to the plane of said cover layers and the improved strength direction of said sheets being located perpendicular to the planes of the cover layers.

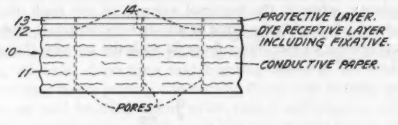
3,906,138
PRINT SHEET

Thomas J. Evensen, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 833,905, Feb. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 728,230, May 10, 1968, abandoned. This application Jan. 24, 1974, Ser. No. 436,069

Int. Cl.[2] B44D 1/18

U.S. Cl. 428—320 4 Claims



1. A print sheet adapted for use in the making of permanent color prints by a dye transfer process comprising a backing and a dye-receptive polymeric coating, said coating consisting essentially of polymeric binder and as a dye fixative a bivalent metal salt of an organic acid in an amount by weight of at least about one-fourth part for each ten parts of said binder, said sheet being characterized by a uniform surface appearance, a resistivity less than about 10^{13} ohms and a porosity value less than about 5 sec./ml., said sheet being sufficiently porous to permit simultaneously close contact with a supporting vacuum platen and an overlying non-porous film.

3,906,139
INSULATED WIRE

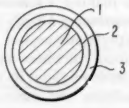
Yukio Hiraoka, Osaka; Sadao Nakao, and Yoshinobu Noda, both of Itami, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasahi, Japan

Filed Sept. 5, 1973, Ser. No. 394,611

Claims priority, application Japan, Sept. 5, 1972, 47-103340

Int. Cl.[2] H01B 3/44

U.S. Cl. 428—383 26 Claims



1. An insulated wire comprising a conductor having thereon a coating of a baked insulating layer of a polyacryl resin and a baked layer of a polyester resin overcoated on said polyacryl resin layer,

said polyacryl resin comprising a copolymer of (a) at least one compound represented by the formula (I):

(I)

(b) at least one compound represented by the formula (II)

(II)

and (c) at least one unsaturated organic acid, said acid having from 3 to about 30 carbon atoms and at least one double bond which is reactable with the double bond of said compound of the formula (I) or (II), wherein R_1, represents a hydrogen atom or an alkyl group having 1 to about 30 carbon atoms, R_2 represents a cyano group, an aldehyde group or a carboxyalkyl ester group having from 2 to about 30 carbon atoms, and R_3 and R_4 each represents a hydrogen atom, an organic group having 1 to about 30 carbon atoms selected from the group consisting of an alkyl group, an amide group, an N-alkylamide group, an alkylol group, a glycidylether group and a glycidylester group, except that both R_3 and R_4 are not simultaneously a hydrogen atom or an alkyl group and said polyester resin comprising a copolymer of (d) at least one compound selected from the group consisting of terephthalic acid and a derivative thereof, and (e) a mixture of polyols comprising at least one diol and at least one of a triol, a tetraol, or a mixture of a triol and a tetraol, and said polyol mixture containing about 40 to about 97% equivalents of said diol.

3,906,140
CO-PELLETIZING SALT MIXTURES

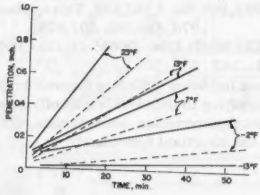
Charles E. Capes, Ottawa, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed July 17, 1972, Ser. No. 272,573

Claims priority, application Canada, Aug. 23, 1971, 121156

Int. Cl.[2] C09K 3/18

U.S. Cl. 428—403 11 Claims



1. Composite layered pellets of non-uniform cross-section each comprising a nucleus including a coarse particle of calcium chloride, surrounded by at least one layer of finer particles comprising sodium chloride, the particles being bonded together by salt bridges formed from a binder liquid solution of said salts on removal of the liquid, and migrated calcium chloride having formed increased calcium chloride content in the surrounding layer or layers, the calcium chloride being present in about 5–30% wt.

3,906,141

PRINTING SYSTEM

Clifford W. Anderson, West Concord; Daniel O. Castrodale, Rochester, and Jerry T. Martin, Plainview, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1973, Ser. No. 388,527
Int. Cl.[2] B41M 5/12
U.S. Cl. 428—411 13 Claims

1. A printing system including

paper stock treated with a lightly colored or colorless solution which provides a source of ions from the group consisting of, ferrous, cuprous and cobaltous ions exposed at the printing surface;

having selectively applied thereto an ink as a controlled pattern of droplets propelled toward said printing surface to form visible indicia thereon;

said ink comprising an aqueous solution including at least one compound from the group consisting of a salt of a metal cyanide complex; 8-hydroxyquinoline; and 1-nitroso-2-naphthol-3,6-disulfonic acid,

said compound being from about 0.25% by weight of said solution to a saturated solution.

3,906,142

SIZING COMPOSITIONS COMPRISING FORTIFIED ROSIN AND THEIR PREPARATION AND USE IN PAPER

Edwin Dowthwaite, Frampton, and Ian Richard Hiskens, Oldfield Park, both of England, assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 22, 1974, Ser. No. 435,561
Claims priority, application United Kingdom, Jan. 22, 1973, 3145/73
Int. Cl.[2] C08L 89/00; D21H 1/44
U.S. Cl. 428—498 16 Claims

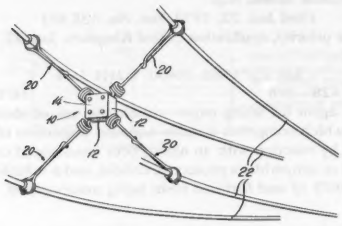
1. An agent for sizing paper without the use of aluminum sulfate, which comprises a stable aqueous dispersion of rosin fortified by reaction with an alpha, beta unsaturated carboxylic acid or anhydride, a protective colloid, and a volatile base, at least 90% of said fortified rosin being unsaponified.

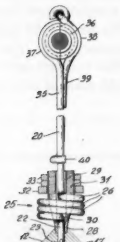
3,906,143

DAMPER SPACER FOR BUNDLE CONDUCTOR

Leopold Leblanc, Victoriaville, Canada, assignor to Roger Beaudoin, Lyster, Canada

Filed July 26, 1974, Ser. No. 492,021
Int. Cl.[2] H02G 7/14, 7/12
U.S. Cl. 174—42 4 Claims





1. A damper spacer for use with bundle conductors comprising:

a. a massive prismatic block-shaped main body member in which the number of prism faces is equal to the number of conductors in the bundle conductor;

b. a plurality of radial arm members of spring steel rod material and numerically equal to the number of conductors in the bundle conductor; each radial arm member comprising, from its inner end consecutively toward its outer end, a short rectilinear portion, a short helically coiled coaxially extending portion, a long stem portion and a conductor gripping portion;

c. means securing each of said radial arm members to said main body member including, in said main body member, a corresponding number of radially extending, coplanar and angularly spaced apart bores normal to the axis of the main body member and equidistant from the ends thereof; each of said bores receiving the short rectilinear portion of one of the radial arm members;

d. means locking the short rectilinear portions in fixed positions in said bores, and

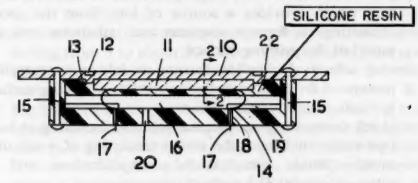
e. wherein each of said radial arm members comprises adjustable means whereby to limit the amount of deflection within the short helically coiled portion thereof.

3,906,144

FILM CIRCUIT ASSEMBLIES

David Wiley, Walsall, England, assignor to The Lucas Electrical Company, Limited, Birmingham, England

Filed Dec. 28, 1973, Ser. No. 429,399
Claims priority, application United Kingdom, Jan. 16, 1973, 2240/73
Int. Cl. H05k 5/06
U.S. Cl. 174—52 S 3 Claims



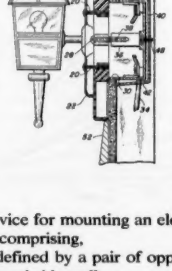
1. A film circuit assembly comprising, a film circuit, a housing for said film circuit, said housing including a support plate formed of a material possessing a high thermal conductivity and on which said film circuit is supported, the housing further including a cover which together with the support plate encloses said film circuit, a layer of a fluid material having a high thermal conductivity sandwiched between said film circuit and said support plate, and, a plurality of resilient electrical connectors carried by said cover and resiliently engaging said film circuit, said cover and said film circuit defining therebetween a cavity which is at least partially filled with a material for protecting said film circuit.

3,906,145

MOUNTING SYSTEM FOR ELECTRICAL FIXTURES

Charles D. Carmichael, 37332 Park Ave., Willoughby, Ohio 44094

Filed Aug. 30, 1973, Ser. No. 392,999
Int. Cl.[2] H02G 3/14
U.S. Cl. 174—61 11 Claims



1. A support device for mounting an electrical fixture on a support structure comprising,

a hollow body defined by a pair of opposed end walls and a pair of opposed side walls,

said end and side walls being integrally joined to and extending outwardly from the rear surface of a generally flat front wall,

an endless inner side wall disposed inwardly of said end and side walls and connected to and defining a central opening in said front wall dapted to provide ingress and egress

to an electrical box for electrical connection with said electrical fixture, and

attachment means on said body including at least one pair of oppositely disposed threaded lugs made integral with said inner side wall for threadably connecting the electrical fixture to said body.

3,906,146

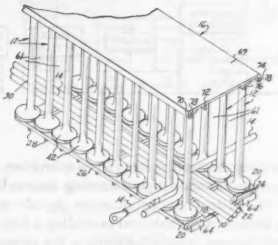
MODULAR WIRING DUCT AND WIRE HOLDER SYSTEM

Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.

Filed Feb. 6, 1974, Ser. No. 440,146

Int. Cl.[2] H02G *3/02*; F16L *3/00*; A47F *7/00*

U.S. Cl. 174—72 A 26 Claims



13. A modular holder unit for supporting and distributing a plurality of elongated flexible objects, said holder unit comprising a rectangular base member, a plurality of substantially equidistant pins disposed in a row parallel to one of the sides of said rectangular base member, said pins being of substantially equal length and each provided with an elongated body portion provided at its free end with an enlarged head portion, said row of pins defining an apertured wall provided with a plurality of openings each of which is formed between the body portions of two adjacent pins for passage of said elongated flexible objects through said openings, and interlocking means integrally disposed at each end of said base member for securely connecting a plurality of individual modular holder units in an end-to-end relationship to form an apertured wall of a predetermined length, wherein said base member has a plurality of aligned apertures disposed substantially parallel to an edge of said base member, and each of said pins has a foot portion comprising a radially extending flange portion engaged with the upper surface of said base member and a tapered projecting portion inserted through one of said apertures and having a major lateral dimension section slightly larger than said aperture, a peripheral groove disposed proximate said major lateral dimension section, said groove snuggly fitting in said aperture, a longitudinal slot formed in the projecting portion and extending at least partially into said groove for allowing said projecting portion to laterally resiliently contract during insertion into said aperture and to laterally resiliently expand for holding the foot portion of said pin with said groove in said aperture, and a recess formed in the surface of said base member accommodating said projecting portion of said pin, wherein each of said pins is resiliently flexible for deflection away from an adjacent pin for providing a spacing between the enlarged head portions of adjacent pins wide enough to accept an elongated flexible object therethrough for routing of said object through the opening between two consecutive adjacent pins, and the body portion of said pins has a gradually decreasing cross section from the foot portion thereof to the head portion thereof.

3,906,147

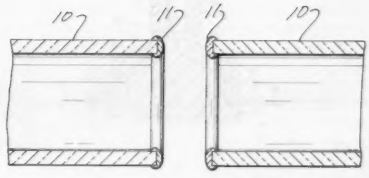
VITREOUS SEALS FOR GLASS ELECTRICAL CONDUITS

Perry P. Pirooz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 14, 1973, Ser. No. 415,738

Int. Cl.[2] H02G *15/08*

U.S. Cl. 174—84 R 8 Claims



1. A glass conduit for containing electrical power conductors comprising a plurality of tubular glass sections, having a composition consisting essentially of the following components in weight percentages:

SiO_2	28–60
B_2O_3	5–25
Al_2O_3	13–35
CaO	0–30
MgO	0–30
Wherein:	
CaO+MgO	10–30
SiO_2+B_2O_3	$\leq$ 75
SiO_2+Al_2O_3	$\leq$ 75
Al_2O_3+CaO+MgO	$\leq$ 60

said sections being hermetically joined together in axial alignment with a totally seal of fused glass having an alkali metal oxide free composition consisting essentially of the following components in the following weight percentages:

ZnO	35–60
B_2O_3	20–35
PbO	5–20
Al_2O_3	1–10
SiO_2	1–10

said sealing glass having the following electrical properties at 150°C, a log AC resistivity (ohm-cm) $\geq$ 10 of a dielectric constant (K) of $\leq$ 10 and a K tanδ $\leq$ 0.1.

3,906,148

FOIL CONNECTOR

James M. Wittes, Linden, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

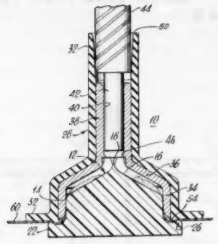
Filed Mar. 14, 1974, Ser. No. 451,095

Int. Cl.[2] H02G *15/08*

U.S. Cl. 174—84 R 9 Claims

1. A joint between a pliable conductor and a termination point comprising; a pliable conductor; a base portion made from an insulating material; a clamping portion made of metal; said pliable conductor positioned intermediate said base portion and said clamping portion; said clamping portion having means to lock said clamping portion to said base portion with at least a portion of said pliable conductor entrapped therebetween; an insulating means about said clamping portion to fully insulate said joint; said clamping portion having a con-

ductor receiving cavity therein to receive a conductor therein; and a length of conductor having a first end and a second end,



said first end coupled to a termination point and said second end positioned in said conductor receiving cavity.

3,906,149

INSULATOR FOR HIGH-VOLTAGE, METAL-CLAD SWITCHING AND TRANSMISSION INSTALLATIONS

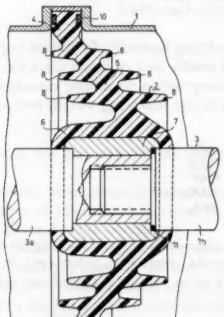
Lothar Hashoff; Günther Luxa; Joachim Thürk, and Armin Diessner, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 13, 1974, Ser. No. 450,882

Claims priority, application Germany, Mar. 21, 1973, 2314675

Int. Cl.[2] H01B *17/56*

U.S. Cl. 174—167 **3 Claims**



1. An insulator for concentrically supporting an electric conductor within a gas-insulated, high-voltage switching and transmission installation having a tubular gas-tight enclosure, the insulator comprising: a hollow conical part having inner and outer conical surfaces, a ring-like part extending from said conical part for engaging the tubular enclosure for fixedly mounting the insulator therein; hollow bushing means centrally located at said conical part for receiving said conductor therein; and, a plurality of mutually concentric cylindrical-like projections formed on said outer surface arranged so as to be spaced one from the other, and a second plurality of mutually concentric cylindrical-like projections formed on said inner surface, said second plurality of projections being likewise arranged so as to be spaced one from the other, said cylindrical-like projections having a length corresponding to one to three times the wall thickness of the insulator.

3,906,150

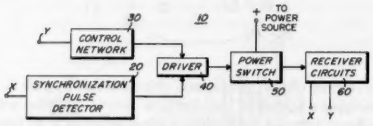
GATE ACTUATED ON/OFF CONTROL FOR TELEVISION RECEIVERS

Thomas Wayne Ivas, Evergreen Park, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed Dec. 15, 1972, Ser. No. 315,697

Int. Cl. H04n *5/44*

U.S. Cl. 178—7.3 R **5 Claims**



1. A receiver turn-off system for a television receiver comprising, synchronization signal sensing means for sensing the presence of vertical synchronization signals associated with television broadcast signals and providing a first control signal in response thereto, means for sensing the presence of vertical blanking signals within the receiver and providing a second control signal in response thereto, said first and second control signals being in time coincidence with one another, and switch means coupled with said synchronization signal sensing means, and said means for sensing the presence of vertical blanking signals responsive to time coincidence of said first and second control signals for de-energizing said receiver in the absence of said either of said control signals.

3,906,151

METHOD AND APPARATUS OF SIGNAL CONVERSION IN PROGRAM-CONTROLLED AUTOMATIC DATA EXCHANGES

Günter Grossmann; Peter Kern; Karl-Heinz Kotter; Bernhard Schaffer; Lothar Schmid, all of Munich; Arnulf Thilenius, Frieding, and Peter Weidner, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 20, 1973, Ser. No. 353,012

Claims priority, application Germany, May 31, 1972, 2226626

Int. Cl.[2] H04L *11/00*

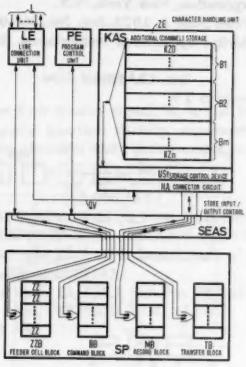
U.S. Cl. 178—3 **8 Claims**

8. In a program controlled data exchange installation having at least one central store containing the data and programs necessary for operating said installation and processing units interoperating with said common storage in a cyclic manner, at least one of said processing units being a program control unit and at least one of said processing units being a line termination unit, the improvement comprising:

character handling means including connector circuit means for regulating traffic with said common storage, control means for determining tasks to be performed and channel storage means divided into storage areas, each containing a plurality of storage locations,

means for selective allocating at least a said storage location, upon initiation of a character translation operation by said program control unit, for the duration of said operation, by entering a line number corresponding to a demanding access line and

means for cyclically accessing said common storage by said channel storage means for transfer of messages and data



to said common storage and for transfer of instructions and data to said channel storage means.

3,906,152

APPARATUS FOR READING A DISC-SHAPED RECORD CARRIER

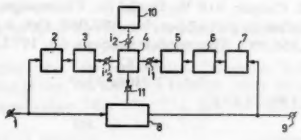
Adrianus Huibert Hoogendijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,625

Claims priority, application Netherlands, Feb. 15, 1974, 7402078

Int. Cl. G11b *5/02*

U.S. Cl. 178—6.7 A **7 Claims**



1. An apparatus for reading a disc-shaped record carrier in which a video signal is recorded in an optically coded form, which signal comprises a first carrier signal component which is frequency-modulated with the luminance information, the apparatus including a correction device for automatically correcting variations in the frequency response of the record carrier as a result of a change of the radial scanning position on the record carrier, said correction device including a correction filter having an input means for receiving at least the detected first carrier signal component, a control input means for varying the frequency response of said correction filter, and an output; a first filter means for extracting the first signal component, a first detection circuit means coupled to said first filter for detecting the amplitude of said first signal component, an integration filter coupled to the output of said detection circuit and which has a relative large time constant, and a comparator circuit means for comparing the output signal of the integration filter with a reference signal and having an output means for supplying a control signal to said control input of the correction filter in response to the difference measured between the two input signals of said comparator circuit.

3,906,153

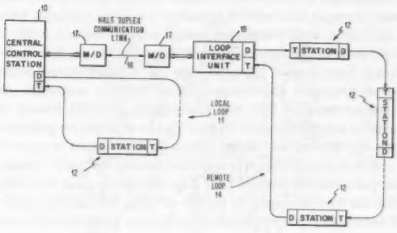
REMOTE SYNCHRONOUS LOOP OPERATION OVER HALF-DUPLEX COMMUNICATIONS LINK

Alexander Polischuk-Sawtschenko, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,606

Int. Cl.² H04J *3/06*

U.S. Cl. 178—58 A **7 Claims**



1. An interface unit located at a remote synchronous serial data communications loop for connecting a central station to the remote synchronous serial data communications loop via a half-duplex data communications link and in which said remote loop may assume a transmit mode in which data from the devices on the loop are sent via the half-duplex link to the central station and a receive mode in which data signals from the central station are received via the half-duplex link and transferred to the devices on the loop comprising:

a first circuit means for generating first clocking signals at a predetermined frequency;

a second circuit means for generating second clocking signals at said predetermined frequency in synchronism with the signals received from said half-duplex communications link;

clock control means responsive to the signals received from said half-duplex communications link and said second clocking signals for simultaneously incrementally adjusting the phase of the first and second clock signal generating means to cause said first and second clocking signals to gradually assume a predetermined phase relationship with respect to the phase of the signals received from said half-duplex communications link;

a first buffer means for receiving data signals from said half-duplex communications link under control of second clocking signals;

a second buffer means for receiving data signals from said first buffer means under control of said first clocking signals;

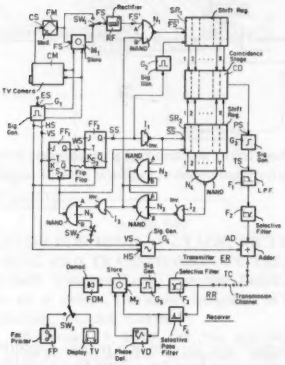
signal generating means for generating control signals under control of said first clocking signals; and

control circuit means responsive to signals received from said half-duplex communications link for transmitting the contents of said second buffer means to the loop when data signals are being received from said half-duplex communications link and for transmitting said control signals from said signal generating means when data signals are not being received whereby said devices on said loop are maintained in synchronism at all times regardless of the direction of transmission on said half-duplex link.

3,906,154
SIGNAL TRANSMISSION SYSTEM

Edmond de Niet, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1973, Ser. No. 417,551
Claims priority, application Netherlands, Nov. 25, 1972, 7216026
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.5 R 15 Claims

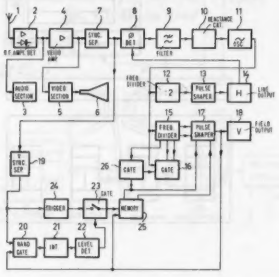


1. A signal transmission system comprising a transmitter conveying a high frequency signal, a transmission channel having a limited bandwidth and a receiver, said transmitter comprising a store having an output which conveys in a cyclical manner in signal repetition periods the high frequency signal to be transmitted, and a circuit through which the store is connectable to the transmission channel during cyclically occurring relatively short time durations, the receiver comprising a store connectable to the transmission channel for cyclically meshing storage of the transmitted signals, the transmitter comprising a first counting circuit means coupled to said transmitter store output for counting signal transitions relative to a reference value present in the signal applied thereto, said counting circuit having a first plurality of outputs which dependent on the counted number of signal transitions convey a binary number, said transmitter furthermore including a second counting circuit having an input for the supply of a counting signal having a repetition period whose duration is equal to the signal repetition period of the high frequency signal and having a second plurality of outputs which dependent on the counted number of signal transitions in the counting signal relative to a reference value convey a binary number, a coincidence stage having respective inputs coupled to said pluralities of outputs of the first and second counting circuits and an output connectable to the transmission channel for the supply of a signal upon the same binary number being present at the two pluralities of inputs of the coincidence stage, the store in the receiver being connectable to the transmission channel during a number of signal repetition periods which is equal to the said number of signal transition counts in the said first and second counting circuits for the cyclically meshing signal storage.

3,906,155
CIRCUIT ARRANGEMENT FOR GENERATING A CONTROL SIGNAL FOR THE FIELD OUTPUT STAGE IN A TELEVISION RECEIVER

Jan van Straaten, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 366,056
Claims priority, application Netherlands, June 15, 1972, 7208147
Int. Cl.[2] H04N 5/04
U.S. Cl. 178—69.5 TV 10 Claims

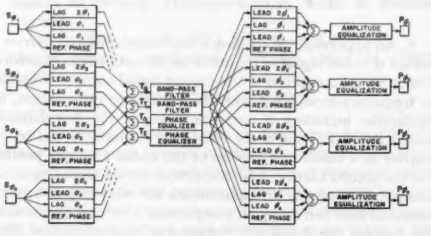


10. A method comprising generating a television line frequency signal or an integral multiple thereof from a received line synchronization signal, said method comprising obtaining a field synchronization signal by frequency dividing said generated signal by a first divisor, continuously detecting lack of synchronization between said obtained field frequency signal and a received field frequency signal, changing said divisor in said dividing step to a second divisor upon detecting said lack of synchronization, and changing said divisor back to said first divisor upon detecting synchronization between said signals.

3,906,156
SIGNAL MATRIXING FOR DIRECTIONAL REPRODUCTION OF SOUND

Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61820

Continuation-in-part of Ser. No. 187,065, Oct. 6, 1971, Pat. No. 3,856,992. This application Sept. 13, 1972, Ser. No. 288,873
Int. Cl. H04r 5/00
U.S. Cl. 179—1 GQ 37 Claims



1. A method of producing signals with directional audio information comprising matrixing source signals representative of sounds from different bearing angles θ, each measured from a source reference direction, to form at least three transmission signals, T , T and T_7, capable of being rematrixed for production of presentation signals, each of said transmission signalshaving encoding mixing coefficients substantially corresponding to values of single-variable 360° repetitive functions of said bearing angles θ, said single-variable functions being

$$T_{\Sigma} = \sum_{k=1}^{n} S_k$$

$$T_{\Delta} = \sum_{k=1}^{n} S_k e^{j(\theta_k + \pi/2)}$$

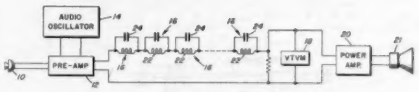
$$T_{T} = \sum_{k=1}^{n} S_k e^{-j(\theta_k + \pi/2)}$$

where S_k is the k-th source signal, θ_k is the bearing angle between the sound location thereby represented and said source reference direction and j is the square root of -1.

3,906,157
METHOD AND APPARATUS FOR TAILORING THE HOUSE CURVE OF A SOUND SYSTEM

Charles R. Boner, and Richard E. Boner, both of 1508 Hardovin Ave., Austin, Tex. 78703

Filed Aug. 13, 1973, Ser. No. 387,607
Int. Cl.² H04R *3/04, 27/00*
U.S. Cl. 179—1 AT **6 Claims**

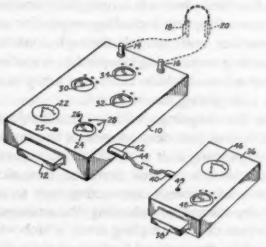


1. A method for tailoring the house curve of a sound reenforcing system, which consists of the steps of:
injecting a sine wave signal into the system,
measuring the amplitude of spikes in the sine wave response of the system at the exact frequencies of reverberations being produced by operation of the system in a reverberant area,
and utilizing filters having a bandwidth of approximately one-fiftieth octave for filtering out said exact frequency spikes without affecting the amplitude of frequencies adjacent thereto.

3,906,158
METHOD AND APPARATUS FOR CONDUCTING AUDIOMETRIC TESTS

James Douglas Lake, 140 Random Rd., Princeton, N.J. 08540

Continuation of Ser. No. 888,292, Dec. 29, 1969, abandoned. This application May 15, 1972, Ser. No. 253,653
Int. Cl. A61b *5/12*
U.S. Cl. 179—1 N **8 Claims**

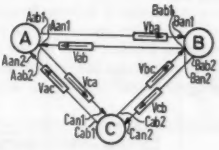


1. In a device for use in conducting audiometric tests on a subject: record means bearing recorded signals, transcriber means including a frame adapted to receive said record means and including reading means operable to read the signals carried by a record means in said frame upon movement of the record means relative to the said reading means, said transcriber means including drive means for driving a said record means in said frame relative to said reading means, said transcriber means also including transducer means comprising an earphone for each ear of a subject under test and operable to convert the signals read from said record means by said reading means to acoustic air borne signals including a first set of acoustic signals in the form of spoken sounds and a second set of acoustic signals in the form of noise of a selected environmental type, at least some of said noise falling within the audible range, and selector means operatively connected to said earphones and selectively operable for causing the supplying of each of said first and second sets of acoustic signals to either one or both of the said earphones, adjustable means for selectively adjusting the amplitude level of said first and second sets of acoustic signals independently, said record means comprising support means receivable by said frame and record element means contained within said support means, said drive means being adapted for operatively engaging and driving said record element means in a single predetermined direction only relative to said support means, and continuously effective control means operatively disposed between said record element means and the said support means and preventing movement of said record element means relative to said support means in a direction other than said single predetermined direction when said drive means is operatively engaged with said record means, said control means adapted to be made ineffective only by means of a special tool thereby to prevent resetting of said record element means by other than an authorized person.

3,906,159
TDM EXCHANGE WITH INCOMING PCM FRAMES DELAYED WITH RESPECT TO OUTGOING PCM FRAMES

Karl-Anton Lutz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 223,557, Feb. 4, 1972, abandoned, which is a continuation of Ser. No. 860,190, Sept. 23, 1969, abandoned. This application Apr. 26, 1973, Ser. No. 354,841
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AQ **1 Claim**



1. In apparatus for transmitting data signals in a time multiplex telecommunication system having a plurality of exchange stations, pairs of said exchange stations being connected by at least a pair of transmission lines for bi-directional transmission, said signals being transmitted thereover in time channels in a pulse frame constituted by a plurality of time channels, the data signals in a given time channel in adjacent pulse frames being equally spaced one from the other, wherein the pulse frames departing on transmission lines carring departing transmissions from a said exchange station are synchronized with each other, wherein pulse frames arriving at said exchange station on transmission lines carrying arriving data signals are synchronized with each other by the insertion of delay means in said arriving transmission lines, wherein for the establishment of a connection through said exchange stations, which connection is in a given time channel in a pulse frame on an arriving line, the next free time channel in a pulse frame on the departing line is assigned, said given and said next time channels occupying the same relative positions in the arriving and departing pulse frames, the improvement comprising:

said delay means being constructed to introduce a delay time such that pulse frames in transmission lines departing from a said exchange station are displaced with respect to those on incoming transmission lines by a period of time having a magnitude of tv, where $tv=(tx+ty,)/2$ and tx and ty being the time period between the time of arrival of a given time channel at said exchange station and the time of departure of the same time channel in one direction of transmission and the other direction of transmission, respectively, whereby $tv=(tr+ts-T)/2$, where T is the duration of a pulse frame and where tr defines the time interval between the time of appearance of a time slot to be allocated to a connection in one direction of transmission over an outgoing line and the time of appearance of the time slot used over the associated incoming line and where ts defines the time interval between the time of appearance of the time slot to be allocated to the connection in the other direction of transmission over an outgoing line and the time of appearance of the time slot over the associated incoming line.

3,906,160

HEADPHONE TYPE FM STEREO RECEIVER

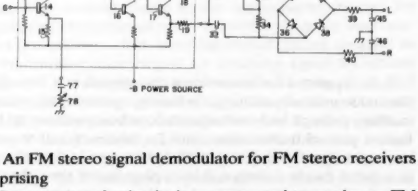
Shoichi Nakamura, Tondabaya; Eizo Mori, Uji; Yoshiteru Onaka, Kadoma, and Tsuneo Okubo, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 222,271, Jan. 31, 1972, abandoned, which is a continuation of Ser. No. 806,469, March 12, 1969, abandoned. This application July 13, 1973, Ser. No. 378,822

Claims priority, application Japan, Apr. 12, 1968, 43-25114; Apr. 18, 1968, 43-26719; Mar. 19, 1968, 43-22066[U]; Mar. 22, 1968, 43-23194[U]; Mar. 22, 1968, 43-23195[U]; Mar. 27, 1968, 43-24926[U]; Mar. 27, 1968, 43-24927[U]; Mar. 27, 1968, 43-24928[U]; Mar. 29, 1968, 43-25624[U]; Mar. 29, 1968, 43-25625[U]; Mar. 29, 1968, 43-25626[U]; Mar. 29, 1968, 43-25627[U]; Mar. 29, 1968, 43-25628[U]; Apr. 4, 1968, 43-27885[U]; Apr. 8, 1968, 43-28954[U]; Apr. 8, 1968, 43-28955[U]; Apr. 8, 1968, 43-28956[U]

Int. Cl. H04b *1/08*

U.S. Cl. 179—15 BT **2 Claims**



1. An FM stereo signal demodulator for FM stereo receivers comprising

a first transistor having its base connected to receive an FM stereo signal from said discriminator, a 19 KC tuning coil connected to the collector of said first transistor, frequency multiplying diodes connected to the secondary winding of said tuning coil, a direct coupled amplifier consisting of second and third transistors, the emitter of said third transistor being connected to the base of said second transistor through more than one resistor so as to obtain the bias of said second transistor, and to obtain the negative feedback loop for the amplifier composed of said second and third transistors, and a switchng circuit consisting of four diodes connected in the shape of a ring, the arrangement being such that a signal received by the 19 KC tuning coil is multiplied to a 38 KC signal by the frequency multiplying diodes, the resultant 38 KC signal being impressed on the direct-coupled amplifier to obtain 38 KC outputs of opposite polarities from the emitter and collector of the third transistor, and said 38 KC output being coupled with a stereophonic signal supplied from the first transistor and then impressed on a pair of connections located at opposite ends of one of the diagonal lines of the switching circuit, whereby separated left and right signals are taken out from opposite ends of another diagonal line of said switching circuit.

3,906,161

METHOD FOR SWITCHING PULSE CODE MODULATED SIGNALS USING TIME-DIVISION MULTIPLEX PRINCIPLES

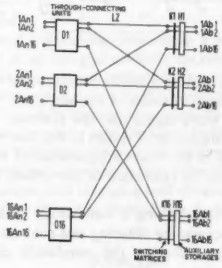
Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 15, 1973, Ser. No. 360,568

Claims priority, application GermanyD, May 26, 1972, 2225702

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AQ **1 Claim**



1. A method for selecting an outgoing time channel for permitting the completion of a connection between time-division multiplex trunks transmitting pulse code modulated (PCM) signals through a time-division multiplex exchange installation having a plurality of through-connecting units, each of which has time channels having little congestion, each said throughconnecting unit including means for causing time channel conversion and spatial through-connection, said through-connecting units being coupled to a spatial switching network to form a time-division multiplex array in a timespace configuration, comprising the steps of:

shifting, if on the outgoing multiplex trunk selected according to the connection desired, and at the output of a said through-connecting unit with which a connection is to be established there is no free common time slot, the time slot of the said through-connecting unit to an adjacent time slot, by means of selecting the crosspoints of the spatial portion of the coupling array which will complete the connection through said adjacent time slot,

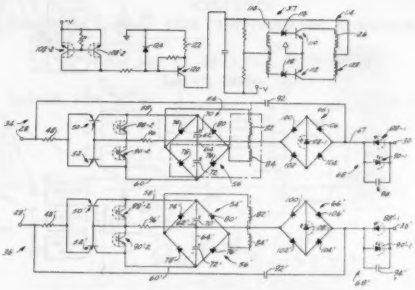
determining the time relationship of said through-connecting unit time slot with respect to the outgoing time channel time slot to be seized and

bridging the time interval between the two time slots occupied, respectively, by said through-connecting unit and said outgoing time channel by providing storage for said through-connecting unit time slot at the output of said spatial switching network.

3,906,162
LOOP EXTENDER WITH BYPASS CAPACITOR DISCHARGE

Frederic R. Sparrevohn, Long Beach, Calif., assignor to Communication Mfg. Co., Long Beach, Calif.

Filed July 30, 1974, Ser. No. 493,166
Int. Cl. H04b *3/36;* **H04q** *1/30*
U.S. Cl. 179—16 F **7 Claims**



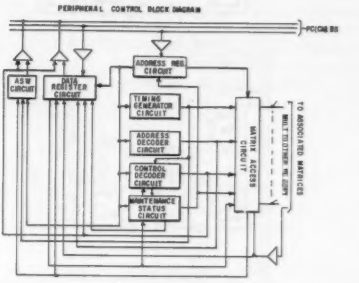
1. A telephone loop extending circuit for aiding central office battery and having first and second voltage insertion circuits, each voltage insertion circuit comprising: a pair of terminals, a circuit path for current flow coupled between terminals of the corresponding pair of terminals and comprising first and second voltage source means, first and second transistors each having base, emitter, and collector electrodes, first sides of said first and second voltage source means, of opposite voltage polarity, being coupled in the circuit path to a first terminal of the corresponding terminal pair, the emitter-collector electrode circuits of said first and second transistors being coupled in the circuit path from a second terminal of the corresponding pair to second sides of, respectively, said first and second voltage source means, optical coupling means corresponding to each said transistor and comprising a light responsive control means coupled to the base electrode of the corresponding transistor for controlling current flow therein and light emitting sensing means coupled in series in the circuit path for sensing externally applied current flow between terminals of the corresponding terminal pair and for applying light to the corresponding light responsive control means, thereby causing the latter to switch the corresponding transistor into saturated conduction coupling the corresponding voltage source means in series in the circuit path and in between terminals of the corresponding terminal pair, bypass capacitor means for bypassing selected signals around the portion of the circuit path formed by said transistors and voltage source means between two places along said circuit path, the improvement in each voltage insertion circuit comprising:

impedance means coupled between the base electrodes of said first and second transistors and the first sides of said first and second voltage source means, and operative, in combination with at least one of said first and second transistors for providing a discharge path for the corresponding bypass capacitor means after removal of central office battery applied from a terminal in one voltage insertion circuit to a terminal in the other voltage insertion circuit.

3,906,163
PERIPHERAL CONTROL UNIT FOR A COMMUNICATION SWITCHING SYSTEM

Edwin F. Brenski, Clarendon Hills; Jan Draayer, Wheaton; Nigel J. E. Reynolds, Elk Grove Village, and Frank A. Risky, Cicero, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 14, 1973, Ser. No. 397,456
Int. Cl.² H04M *3/00;* **G06F** *13/00, 11/00*
U.S. Cl. 179—18 ES **15 Claims**



1. In a communication switching system including a common control apparatus having a central processing means for providing read and write instructions for controlling the operation of equipment of said system, a peripheral control unit means comprising:

a plurality of control matrices each having a plurality of groups of bistable control devices, each control device being connected to a different control point of said system, a plurality of sense matrices each having a plurality of groups of sensing devices, each sensing device being connected to a different sense point of said system;

at least one peripheral controller means associated with at least certain ones of said matrices, said peripheral control means including first access means responsive to a write instruction provided by said central processing means to select a group of control devices in one of said control matrices and second access means to selectively modify the states of the selected control devices in accordance with the write instruction to thereby selectively modify the conditions at predetermined ones of said control points; and

timing generator means for synchronizing the operation of said peripheral controller means.

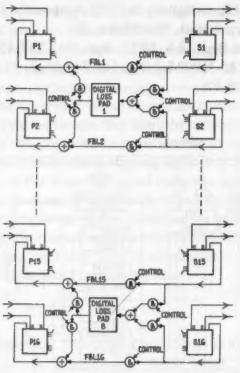
3,906,164
DIGITAL SWITCHING NETWORKS WITH FEED-BACK LINK FOR ALTERNATE ROUTING

Alexander Schroder Philip, and John Spencer Arnold, both of Liverpool, England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 16, 1974, Ser. No. 461,460
Claims priority, application United Kingdom, Apr. 19, 1973, 18872/73
Int. Cl.² H04M *3/00*
U.S. Cl. 179—18 EA **2 Claims**

1. A two-stage full availability telecommunications space switching network particularly adapted for use in a time division multiplex switching system comprising a plurality of primary stage switching matrices adapted to connect groups of receive superhighways to a plurality of interstage links, a plurality of secondary stage switching matrices adapted to connect a number of interstage links to a group of transmit super-highways, each secondary stage switching matrix including one additional outlet and each primary stage switching network including one additional inlet, and a plurality of feed-back paths each interconnecting on a mutually exclusive

basis, one additional outlet with one additional inlet, each said feed-back path also including a switchable digital loss pad for



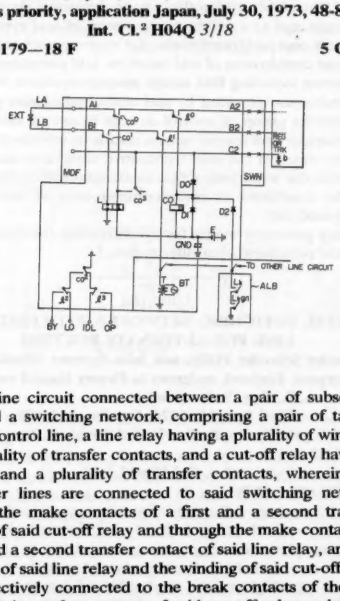
allowing selective equalization between incoming and outgoing channels.

3,906,165

LINE CIRCUIT IN AUTOMATIC SWITCHING SYSTEM

Hiromi Moriyama, Fujisawa; Motosuke Kuwabara, Yokohama, and Katsuyuki Jin, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 25, 1974, Ser. No. 491,633
Claims priority, application Japan, July 30, 1973, 48-84878
Int. Cl.[2] H04Q *3/18*
U.S. Cl. 179—18 F **5 Claims**



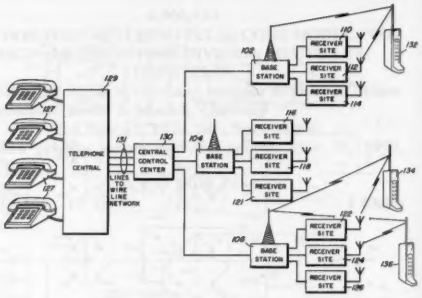
1. A line circuit connected between a pair of subscriber lines and a switching network, comprising a pair of talking lines, a control line, a line relay having a plurality of windings and plurality of transfer contacts, and a cut-off relay having a winding and a plurality of transfer contacts, wherein said subscriber lines are connected to said switching network through the make contacts of a first and a second transfer contact of said cut-off relay and through the make contacts of a first and a second transfer contact of said line relay, and the windings of said line relay and the winding of said cut-off relay are respectively connected to the break contacts of the first and second transfer contacts of said cut-off relay and to the break contact of the first transfer contact of said line relay, one of said windings of said line relay and said winding of said cut-off relay being further connected to said control line through the make contact of a third transfer contact of said cut-off relay and through a diode respectively.

3,906,166

RADIO TELEPHONE SYSTEM

Martin Cooper, Glencoe; Richard W. Dronsuth, Westchester; Albert J. Mikulski, Chicago; Charles N. Lynk, Jr., Arlington Heights; James J. Mikulski, Deerfield; John F. Mitchell, Elmhurst; Roy A. Richardson, Skokie, and John H. Sangster, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 17, 1973, Ser. No. 403,725
Int. Cl. H04q *7/00*
U.S. Cl. 179—41 A **31 Claims**



1. A portable radio telephone system comprising:

a first base station transmitter site having a first predetermined coverage area and means for simultaneously transmitting signals on a first outgoing signalling channel and a plurality of first outgoing communications channels;

a plurality of first receiver sites associated with said first base station transmitter site, each first receiver site having a first predetermined reception area smaller than said first predetermined coverage area, each of said first receiver sites being located for causing at least a portion of each of said first reception areas to overlap a portion of said first coverage area, each first receiver site having means for simultaneously receiving signals on a first incoming signalling channel paired with said first outgoing signalling channel and a plurality of first incoming communications channels, each of said first incoming communications channels being paired with one of said first outgoing communications channels;

means connecting said first base station transmitter site and said first receiver sites, said connecting means including means for comparing the strength of the signals received by said first receiver sites and for placing the first receiver site receiving the strongest signal on the first incoming signalling channel in electrical communication with said first base station transmitter site;

a second base station transmitter site having a second predetermined coverage area and means for simultaneously transmitting signals on a second outgoing signalling channel and a plurality of second outgoing communications channels;

a plurality of second receiver sites associated with said second base station transmitter site, each second receiver site having a second predetermined reception area smaller than said second predetermined coverage area, each of said second receiver sites being located for causing at least a portion of each of said second reception areas to overlap a portion of said second coverage area, one of said second receiver sites being located for causing at least a portion of the second reception area thereof to overlap a portion of said first coverage area, each second receiver site having means for simultaneously receiving signals on a second incoming signalling channel paired with said second outgoing signalling channel and a plurality of second incoming communications channels, each of said second incoming communications channels being

paired with one of said second outgoing communications channels; and

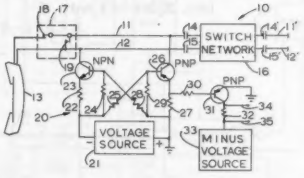
means connecting said second base station transmitter site and said second receiver sites, said last mentioned connecting means including means for comparing the strength of the signals received by said second receiver sites and for placing the second receiver sites receiving the strongest signal on the second incoming signalling channel in electrical communication with said second base station transmitter.

3,906,167

CONSTANT CURRENT POWERED TELEPHONE CIRCUITS

Thaddeous J. Baker, 1216 Cherrywood Dr., Richardson, Tex. 75080

Filed July 17, 1973, Ser. No. 379,932
Int. Cl. H04m *1/00*
U.S. Cl. 179—81 R **14 Claims**



1. In a telephone circuit having a two wire telephone connection to a telephone instrument and through a blocking capacitor for each line to other telephone system line wires, a stabilized current generator circuit supplying constant current when the two-wire telephone line is closed through the telephone instrument comprising, a voltage source having at least two terminals, a positive terminal and a relatively negative terminal; a first multielectrode solid state device having at least an input electrode, a control electrode, and an output electrode with the output electrode connected to a first wire of said two-wire telephone line; the input electrode of said multi-electrode solid state device being connected through first resistive means to a first terminal of said voltage source; first voltage divider means connected between the positive terminal and the relatively negative terminal of said voltage source; said voltage divider means having a tap connection with said control electrode of said multi-electrode solid state device; circuit means interconnecting a second wire of said two-wire telephone line and a second terminal of said voltage source; and wherein said first multi-electrode solid state device is a transistor.

3,906,168

VISUAL STATUS INDICATOR CIRCUIT

James Royce McEowen, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Holmdel, N.J.

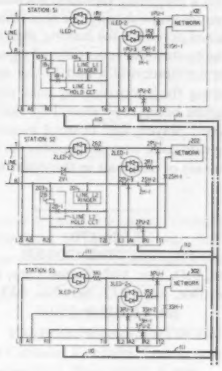
Filed Dec. 12, 1973, Ser. No. 426,643
Int. Cl. H04m *1/22*
U.S. Cl. 179—84 L **18 Claims**

1. A subscriber telephone station comprising:

a first pair of communication leads for connecting said subscriber station to a telephone switching network, said subscriber station including

a transducing network connectable across said first pair of communication leads and operable for communicating intelligible information to and from said subscriber station over said communication leads, said transducing network being activated from voltage potentials present on said first pair of communication leads from said telephone switching network;

a first ringer connected across said first pair of communication leads and operable for providing audible signals to a subscriber indicating an incoming calling connection, said ringer being activated from pulsating voltage potentials supplied over said first pair of communication leads; and



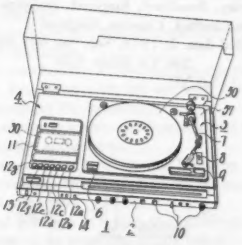
a first current-sensitive light indicating device connected in one lead of said first pair of communication leads at a point in said lead closer to said telephone switching network than the connection of either said transducing network or said first ringer so that said first light indicating device will provide a pulsating visual indication when said first ringer is being activated and will provide a steady visual indication when said transducing means is being activated.

3,906,169

COMBINED PHONOGRAPH RECORD PLAYER AND MAGNETIC TAPE RECORDER FOR RECORDING ON TAPE THE CONTENT OF A PHONOGRAPH RECORD

Koichi Iwase, Chofu; Takahiko Saito, Kamakura, and Schosuke Tanaka, Kawasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

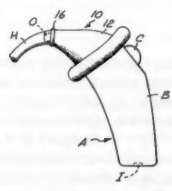
Filed Jan. 22, 1974, Ser. No. 435,468
Claims priority, application Japan, Jan. 22, 1973, 48-10138
Int. Cl.[2] G11B *13/02*
U.S. Cl. 179—100.1 A **11 Claims**



1. The combination of a phonograph record player including a rotary turntable for carrying a phonograph record having a record groove with signals recorded in the latter, a pickup having a stylus engageable with the record groove for tracking the latter and reproducing the signals recorded therein, a tone arm carrying said pickup and being movable for lowering and

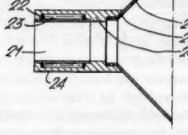
raising said stylus into and out of contact, respectively, with the phonograph record and for said tracking of the record groove by said stylus when the latter contacts the phonograph record, and means actuable for lifting said tone arm to raise said stylus out of contact with said phonograph record and thereby halt the tracking of said record groove by said stylus and the reproducing of said recorded signals by said pickup; a magnetic tape recorder for recording the signals reproduced by said pickup on a magnetic tape and including drive means operative to drive said tape during the recording of said signals thereon, and means actuable for halting the operation of said drive means so as to stop the recording of signals on said tape; detecting means for detecting a halt in the operation of said drive means during the recording by said magnetic tape recorder of the signals being reproduced by said pickup and the phonograph record player; and control means actuating said means for lifting said tone arm in response to the detection by said detecting means of said halt in the operation of said drive means.

3,906,170
PROTECTIVE COVER
Daniel W. Guice, P.O. Box 102, Salton City, Calif. 92274
Filed Dec. 10, 1973, Ser. No. 423,181
Int. Cl. H04r *25/00*
U.S. Cl. 179—107 R **5 Claims**



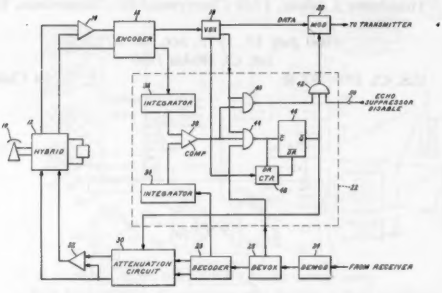
1. A protective cover for a hearing aid, comprising:
a hollow body member of waterproof material adapted to receive a hearing aid and having an opening through which the hearing aid is received, said opening facing downwardly in the operative position of the hearing aid for protection of the hearing aid against descending harmful matter, said member having a plurality of openings for accommodating the input and output sections of the hearing aid, and said material being stretchable, and said member being stretched for receipt of the hearing aid and accommodation of the sections thereof.

3,906,171
TRANSDUCERS
Michael Braceley, Bradford, England, assignor to The Rank Organisation Limited, London, England
Filed Jan. 2, 1974, Ser. No. 409,665
Int. Cl. H04r *9/00*
U.S. Cl. 179—115.5 VC **13 Claims**



1. A voice coil for an electro-acoustic transducer, said coil comprising a plurality of turns of insulated wire encapsulated in a setting material forming an encapsulation, said encapsulation including a portion extending axially of said coil and forming a connection between said coil and a diaphragm of an electro-acoustic transducer.

3,906,172
DIGITAL ECHO SUPPRESSOR
David F. Hoeschele, Jr., Norristown, and Eugene H. Barnes, Philadelphia, both of Pa., assignors to General Electric Company, Fairfield, Conn.
Filed Apr. 22, 1974, Ser. No. 463,091
Int. Cl.² H04B *3/20*
U.S. Cl. 179—170.6 **9 Claims**

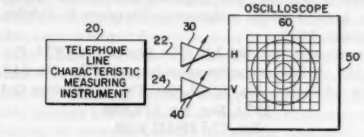


1. In a communication system having means for interconnecting a two-wire circuit to a four-wire circuit wherein said four-wire circuit comprises separate two-wire paths for transmission and reception of signals and includes a voice-operated switch in each path for normally open circuiting each of said paths, a digital echo suppressor comprising:
first means for comparing outgoing signals with incoming signals, said first means producing a signal of first logical significance when said outgoing signals are of greater amplitude than said incoming signals and producing a signal of second logical significance when said outgoing signals are of lesser amplitude than said incoming signals;
second means responsive to said signal of second logical significance for establishing a first condition wherein said voice-operated switch in said transmission path is precluded from enabling said transmission path;
third means responsive to said signal of first logical significance and to said incoming and said outgoing signals for establishing a second condition wherein said voice-operated switch in said transmission path is not precluded from enabling said transmission path and a predetermined impedance is inserted in said two-wire reception path; and
fourth means for maintaining said second condition for a predetermined time interval after said first output signal terminates.

3,906,173
TELEPHONE LINE CHARACTERISTIC MEASURING INSTRUMENT AND DISPLAY
Frank R. Bradley, 9 Dash Pl., Bronx, N.Y. 10463
Filed Mar. 27, 1974, Ser. No. 455,197
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **24 Claims**

1. A transmission path characteristic measuring instrument and display comprising means for processing a received signal having test tone and disturbance components therein to derive a first signal substantially representative of the instantaneous in-phase component of the total disturbance of interest on the received test tone and a second signal substantially representative of the instantaneous quadrature component of the total disturbance of interest on the received test tone, display

means having first and second orthogonal input circuits responsive to the application of signals thereto for generating a



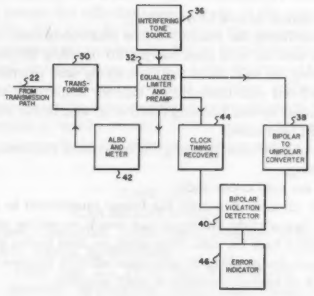
display, and means for coupling each of said first and second signals to a respective one of said first and second orthogonal input circuits.

3,906,174

CABLE PAIR TESTING ARRANGEMENT

Berton E. Dotter, Jr., Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 16, 1973, Ser. No. 416,480
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **18 Claims**



1. Apparatus for testing the pulse transmission characteristics of a cable pair which comprises:

means for generating a pseudo-ternary pulse train in accordance with predetermined coding rules, the violation of said rules being indicative of an error in the pulse train, for transmission of said pseudo-ternary pulse train over the cable pair;

means for generating an interfering tone signal;

level control means operatively connected between said interfering tone signal generating means and said violation detection means to add predetermined levels of the interfering signal with said pseudo-ternary pulse train until violation of the coding rules occurs; and,

means for detecting violations in the coding rules of said pulse train and giving indications thereof.

3,906,175

MULTIPLE LINK NODAL SWITCHING NETWORK

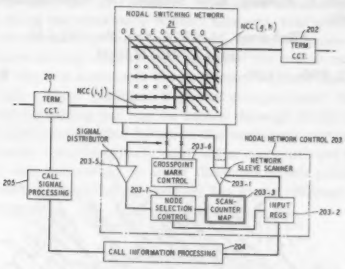
Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1974, Ser. No. 452,800
Int. Cl.² H04Q *3/56*
U.S. Cl. 179—18 GE **12 Claims**

12. A nodal switching system comprising a plurality of switching nodes,

a plurality of groups of links for connecting each node with respective ones of its neighboring nodes,

means for designating a particular link group of a given node of said plurality of switching nodes for connection to a respective link group of one of its neighboring nodes, and



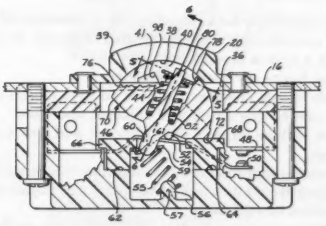
means responsive to said link group designating means for selecting idle links in said particular link group for extending a connection between neighboring nodes.

3,906,176

TAMPERPROOF SWITCH

Ernest Reinhold Carlson, Fairfield, Conn., assignor to Harvey Hubbell, Incorporated, Bridgeport, Conn.

Filed Aug. 2, 1974, Ser. No. 494,319
Int. Cl.² H01H *27/00*
U.S. Cl. 200—42 T **6 Claims**



1. A tamper proof key operated electric switch comprising a housing;

a switch mechanism carried by the housing, said switch mechanism including an actuator moveable along a predetermined path to

a first position in which the switch is in one condition of operation, and

a second position in which the switch is in another condition of operation;

said switch mechanism including key receiving means to receive a key for moving the actuator to said positions;

blocking means in the housing;

a blocking element within the housing and moveable with respect to the actuator to

a blocking position in which the blocking element cooperates with the blocking means to prevent movement of the actuator, and

a released position in which the actuator can be moved from one of its positions to the other;

spring means for urging said blocking element toward its blocking position;

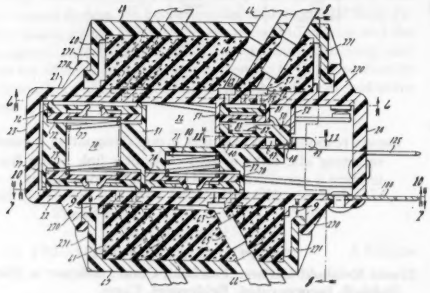
said blocking element having surface means positioned for engagement by a key inserted in said key receiving means for moving said blocking element to said released position so that said actuator can be moved to said positions upon insertion of the key.

3,906,177

ELECTROMOTIVE AND FLUID PRESSURE FORCE SWITCH WITH MAZE VALVES

Theodore E. Fiddler, 1268 Suffield Dr., Birmingham, Mich. 48009

Filed June 24, 1974, Ser. No. 482,644
Int. Cl.[2] H01H 9/06
U.S. Cl. 200—61.86 6 Claims



1. An apparatus for controlling the application of EMF and FPF in coordination with one another to power devices selectively in a system comprising,

a case having an interior chamber,

a slide in said chamber movable relative to said case;

said case having a first wall adjacent said slide;

a first surface on said slide adjacent said first wall of said case,

electrical supply and use contacts mounted in said chamber adjacent said first wall of said case and adjacent said first surface of said slide,

electric conductors leading from said contacts for connection to supply and use in a system,

switch means in said chamber of said case associated with said first wall of said case and said first surface of said slide actuated by movement of said slide relative to said case,

said case having a second wall adjacent said slide;

a second surface on said slide adjacent said second wall of said case,

said second wall of said case having FPF supply and use ports leading through said second wall;

a maze valve facing said second wall of said case in sliding relationship thereto over said ports therein,

means connecting said valve on said second surface of said slide for movement with said slide relative to said ports to interconnect FPF supply and use ports at a selected position of said slide to complete a fluid circuit in a system,

a resilient block on the outside of said case overlying said second ported wall,

said block having an aperture paired with and leading to each said port in said second wall,

a tube inserted in each said aperture of said block, and

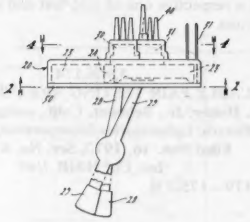
means compressingly securing said block against said second wall in sealing relationship therewith and the compression forces in said block confining each said block aperture to its said paired port and securing said block around said tubes in sealing relationship therewith to confine communication of each said aperture to its respective paired tube.

3,906,178

ELECTRICAL FLUID SWITCH WITH CROSSING SLIDE CHAMBERS

Theodore E. Fiddler, Birmingham, and Arnold G. Adams, Troy, both of Mich., assignors to Theodore E. Fiddler, Birmingham, Mich.

Continuation of Ser. No. 345,977, March 29, 1973, Pat. No. 3,845,257, which is a continuation-in-part of Ser. No. 315,106, Dec. 14, 1972, Pat. No. 3,824,356. This application Oct. 21, 1974, Ser. No. 516,686
Int. Cl.[2] H01H 9/06
U.S. Cl. 200—61.86 2 Claims



1. A control device comprising,

a case defining an interior linear slide chamber;

a front wall on said case having an opening therein;

a housing on said front wall overlying said opening in said case front wall defining an interior transverse cross-slide chamber in said housing relative to said linear slide chamber in said case;

a cross-slide in said housing for transverse movement in said housing;

a cam on said cross-slide;

a linear slide in said case for linear movement in said case; said linear slide having a cam track receiving and engaging said cam on said cross-slide so that linear movement of said linear slide in said case effects transverse movement of said cross-slide in said housing,

means for moving said linear slide;

said housing having a face wall;

FPF ports in said face wall of said housing;

means surmounting said ports for connecting said ports to FPF supply and use;

a channel maze switch-valve on said cross-slide facing said ports for selectably interconnecting and blocking fluid communication between said ports relative to FPF supply and use coordinated with the position of said cross-slide in said housing;

EMF contacts on said housing adjacent said cross-slide,

connector means on said housing connected to said contacts for attaching EMF supply and use lines to said contacts, and

means on said cross-slide facing said contacts for selectably interconnecting and disconnecting electrical communication between said contacts relative to EMF supply and use coordinated with the position of said cross-slide in said housing.

3,906,179

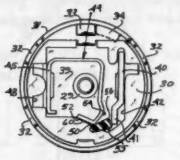
ELECTRICAL SWITCH AND COMBINATION ELECTRICAL RESISTOR AND SWITCH

Jack A. English, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Continuation of Ser. No. 95,518, Dec. 7, 1970, abandoned. This application May 29, 1973, Ser. No. 364,506
Int. Cl. H01h 21/40
U.S. Cl. 200—68 12 Claims

1. An electric switch comprising a housing, a stationary contact supported in the housing, a resilient member having a movable contact and a terminal integral therewith supported

in the housing, both the movable contact and the terminal being made from the same material and having the same thickness, said movable contact being preformed to effect a bias against said stationary contact, a camming surface integral with the housing and adjacent to the movable contact, a movable cam mounted for movement in an interference path with said resilient member for moving the movable contact into and out of operative engagement with the stationary contact, the camming surface controlling movement of the movable contact toward and away from the stationary contact and biasing the movable contact toward the stationary contact



when the cam is spaced from the movable contact, said movable contact being mounted for movement both along said stationary contact and away from said stationary contact, and actuating means for effecting movements of the cam whereby upon moving the cam in one direction the cam engages the movable contact increasing the force between the movable contact and the stationary contact until the movable contact is displaced into a labile neutral position storing energy therein, the movable contact after passing through the labile neutral position rapidly moving with a snap action motion in a direction opposite to the direction of movement of the cam.

3,906,180

GAS-BLAST SWITCH

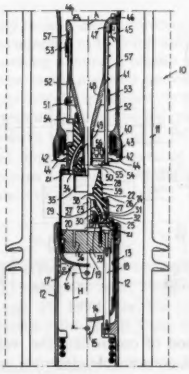
Fritz Glarner, Grenchen, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Apr. 22, 1974, Ser. No. 463,105

Claims priority, application Switzerland, June 4, 1973, 8062/73

Int. Cl.[2] H01H *33/70*

U.S. Cl. 200—148 A **9 Claims**



1. A gas-blast switch comprising a stationary contact element, a movable contact element, a blast nozzle movable along with the movable contact element and surrounding said movable contact element, said blast nozzle having an inlet side and an outlet diffuser, means defining a compression compartment for an extinguishing gas, the inlet side of the blast nozzle being in flow communication with the compression compartment for the extinguishing gas and which compression compartment can be placed under pressure by a cut-off movement of the switch, an electrically conductive screening body guided along the stationary contact element, said electrically conductive screening body being displaceable by means of the blast nozzle during a cut-on movement of the switch out of its position where it surrounds the stationary contact element in the switch cut-off position, a jacket compartment through which extinguishing gas can be blown through in the switch cut-off position provided between the stationary contact element and the screening body, said jacket compartment having an inlet side possessing an inner diameter which practically aligns with a blast cone formed by the outlet diffuser of the blast nozzle.

3,906,181

INDUCTION HEATING APPARATUS FOR MINIMIZING VIBRATION AND NOISE

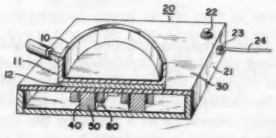
Masahiro Hibino, Toyonaka; Toshio Ito, Suita; Masatami Iwamoto, Itami; Ikuko Nomura, Suita, and Fukutaro Kishimoto, Nishinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

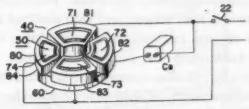
Filed June 22, 1973, Ser. No. 372,610

Claims priority, application Japan, Aug. 18, 1972, 47-82604

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.49 **18 Claims**





1. Induction heating appliance comprising:
an exciter for induction heating a heated element,
said exciter comprising,
a first magnetic pole having a first excitation winding disposed adjacent to said element,
a second magnetic pole having a second excitation winding disposed adjacent to said element,
a third magnetic pole having a third excitation winding disposed adjacent to said element,
a fourth magnetic pole having a fourth excitation winding disposed adjacent to said element,
means connecting said first excitation winding to said third excitation winding to form a first circuit,
means connecting said second excitation winding to said fourth excitation winding to form a second circuit,
means connecting a first low frequency current to said first circuit,
means connecting a second low frequency current which is substantially 90° out of phase with said first current to said second circuit,
whereby a magnetic force generated by said first circuit is equal and opposite to a magnetic force generated by said second circuit in order to minimize vibration and noise.

3,906,182
CHAIN WELDING MACHINE

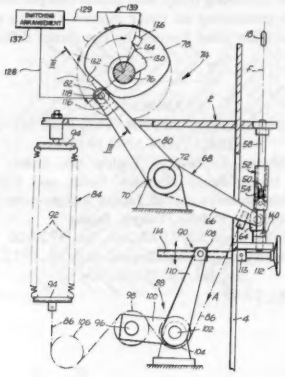
Gerhard Lange, Reutlingen, Germany, assignor to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid, Reutlingen, Germany

Filed Apr. 8, 1974, Ser. No. 458,516

Claims priority, application Germany, Apr. 7, 1973, 2317690

Int. Cl.[2] B21L *3/02*

U.S. Cl. 219—51 **12 Claims**



1. In a chain welding machine for resistance butt welding of interlinked chain links comprising oppositely movable compression members for engaging the rounded parts of a chain link to be welded, said compression members being movable in opposite directions as a result of the action of a control lever which carries a wheel which rolls on the periphery of a control cam plate, the improvement comprising said wheel and a portion of the periphery of said cam plate being constructed of electrically conducting material to form an electrical contact therebetween, electrical insulator means being provided between said wheel and said control lever, and electrical circuit means comprising a switching means for performing an indication or control function, said switching means being electrically connected to said wheel and said portion of the periphery of said cam plate, whereby separation of said portion of the periphery of said cam plate from said wheel will open said electrical contact thereby energizing said switching means.

3,906,183
CHAIN WELDING MACHINE

Gerhard Lange, Reutlingen, Germany, assignor to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid, Reutlingen, Germany

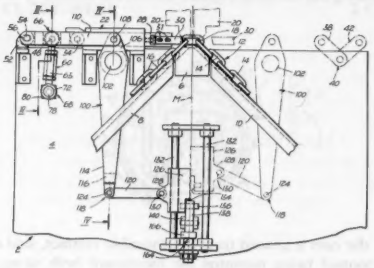
Filed Apr. 8, 1974, Ser. No. 458,536

Claims priority, application Germany, Apr. 7, 1973, 2317691

Int. Cl. B21l *3/02*

U.S. Cl. 219—51 **26 Claims**

1. A chain welding machine for the resistance butt welding of interlinked chain links bent into the shape of a C, comprising a frame including a saddle for supporting the link to be welded, two guide supports inclined with respect to the horizontal for supporting the unwelded chain links which are interlinked with the chain link which is to be welded, two compression levers pivotable about parallel axes by means of a control shaft through at least one drive means, two tool carriers coupled to said compression levers for compression tools adapted to engage on the rounded portions of the chain link which is to be welded, said compression tools being movable in opposite directions as said compression levers are pivoted in opposition to each other, each of said tool carriers having one end which is remote from its respective compression tool and which is articulated on an outer end of a first leg of a two-legged first toggle lever which can be bent and stretched in a definite plane (F), said toggle lever having a second leg which has an outer end mounted for rotation about an axis which is perpendicular to said defined plane (F) on a bearing rigid with said frame and displaceable with respect to said bearing, said toggle lever being coupled by means of a



connecting rod to a lever of a cam gear, said cam gear having a cam plate which is mounted on a driven control shaft and wherein each of said compression levers is coupled to said second leg of its associated first toggle lever, whereby rotation of said cam plate will cause pivotable reciprocation of said connecting rod in accordance with the configuration of said cam plate thereby causing alternate bending and stretching of said toggle lever to alternately advance said respective compression tool forward into engagement with a chain link which is to be welded and retract it therefrom.

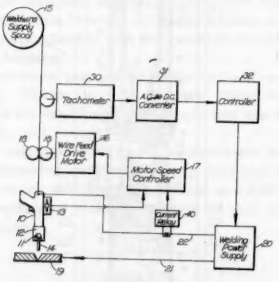
3,906,184
WELDING PROCESS

Francis E. Gibbs, Pleasanton, and John J. Dempsey, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed May 25, 1973, Ser. No. 363,898

Int. Cl.[2] B23K *9/10*

U.S. Cl. 219—131 F **15 Claims**



1. In the method of controlling the welded current in an inert gas shielded, consumable electrode arc welding process, wherein an independently controlled electrode wire feeding device operates to feed electrode wire through a welding torch to a workpiece and an electrical power source provides welding current to said electrode wire, the improvement in the control of the welding current during welding start-up and operation comprising:

a. by means independent of said wire feeding device, sensing the actual velocity of the electrode wire being fed to

a workpiece when said electrode wire feeding device is being controlled and generating a signal representing the actual velocity sensed; and

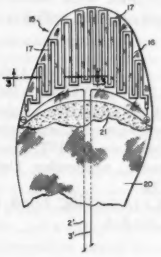
b. receiving said velocity signal and by means responsive to said velocity signal generating a second signal to control the welding current output of said electrical power source to provide a welding current to said electrode wire which satisfies a predetermined relationship between the welding current and electrode wire velocity.

3,906,185

HEATED INSOLE CONSTRUCTION

Alexander Louis Gross, Aspen, Colo., and Erik O. Giese, Key Biscayne, Fla., assignors to Comfort Products, Inc., Aspen, Colo.

Filed Nov. 7, 1974, Ser. No. 521,880
Int. Cl.² H05B *1/00, 3/16*
U.S. Cl. 219—211 **7 Claims**



1. An electrically heated insole construction having a heel area and a toe area adapted to be fitted into a shoe, said insole construction comprising a layer of plastic mesh material with the openings in the mesh material providing air insulation spaces, a layer of electrically insulative plastic material overlying said layer of mesh material in the toe area of the insole, an electrically conductive circuit printed on the side of said insulation material opposite said layer of plastic mesh, and electrical wiring connected to said printed circuit and adapted to extend to a source of electric power.

3,906,186

ELECTRIC HEATED APPLICATOR TOOL

Walter J. Szolis, 373 Mayville Ave., Pittsburgh, Pa. 15226

Filed Apr. 29, 1974, Ser. No. 464,929
Int. Cl.² H05B *1/00;* **B44B** *5/00;* **B23K** *3/02*
U.S. Cl. 219—242 **1 Claim**

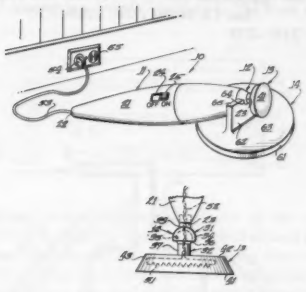
1. A compact heat applicator device intended for use in the affixing of iron-on letters, symbols and the like to fabrics, such as clothing and the like, the device comprising:

an elongated hollow handle defining body member having a back end and a front end;

swivel joint means affixed to said front end and projecting axially outwardly therefrom;

a heating heat affixed to a projecting end of said swivel joint means;

means disposed in said heating head for electrically heating said heating head; and



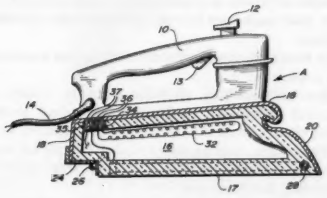
electrical circuit means adapted to connect said electrical heating means to a suitable source of electrical energy.

3,906,187

INFRARED PRESSING IRON WITH DETACHABLE THROWAWAY SOLE PLATE AND OPTIONAL ULTRAVIOLET SOURCE

Alexander Turoczi, Jr., R.D. No. 1, Bath, Pa. 18014

Filed Feb. 5, 1975, Ser. No. 547,219
Int. Cl.² D06F *75/24*
U.S. Cl. 219—254 **10 Claims**



1. A pressing iron comprising:

a. a detachable, disposable sole plate, said sole plate including a molded, hollow, evacuated glass shell having a generally flat bottom portion to engage the material to be pressed and generally curving upward therefrom to form an upper portion shaped to mate with a handle;

b. an infrared heating element disposed within said hollow shell operatively connected to a power source through a terminal mounted within said shell wall proximate said upper shell portion, said terminal means and said shell wall forming together a continuous, integral, sealed sole plate unit;

c. a handle removably engaged with said sole plate;

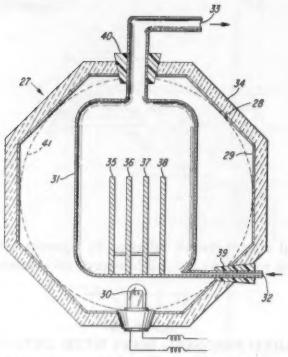
d. wiring means disposed within said handle and adapted to connect with a power source at one terminal and to mate with the infrared heating element at the other terminal; and

e. fastening means to hold together said handle and said sole plate.

3,906,188
RADIANT HEAT BOILER

Joseph A. Gamell, Ackley-Shilling Hall, Western Michigan University, Kalamazoo, Mich. 49001

Division of Ser. No. 196,478, Nov. 8, 1971, Pat. No. 3,800,528.
This application Oct. 1, 1973, Ser. No. 402,063
Int. Cl. H05b 1/00; F22b 1/28
U.S. Cl. 219—275 9 Claims



1. A radiant heat boiler which comprises

a hollow hermetically-sealed, heat-insulated enclosure, the interior of which is evacuated to a subatmospheric pressure, said enclosure having a substantially globular inner surface;

radiant heat reflecting surfaces covering the inner surface of the enclosure;

a hollow substantially globular pressure vessel centrally situated within said enclosure, said vessel including an outer shell provided with a fluid inlet means and a fluid outlet means, said pressure vessel having its outer shell about the entire periphery thereof spaced apart from the reflecting surfaces; and

at least one localized radiant heat source within the enclosure in the space between the reflecting surfaces and the outer shell of the pressure vessel.

3,906,189
PASSIVE RANGE COMPUTER

Michael Schmookler, 5913 Eastern Ave., Hyattsville, Md. 20782

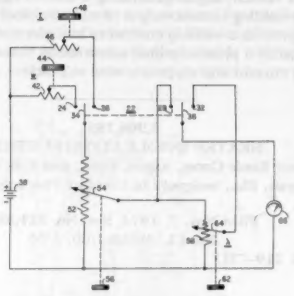
Filed July 15, 1965, Ser. No. 473,570
Int. Cl. G06g 7/80
U.S. Cl. 235—61.5 S 9 Claims

1. A method whereby a pilot of a vehicle determines the range of an object comprising the steps of:

Maneuvering said vehicle into a line of sight course with said object and obtaining the rate of turning w while in said line of sight course;

Turning said vehicle through an angle λ to be in a lead collision course with said object and obtaining the velocity I while in said lead collision course and

Computing the range of said object from the quantities *w*,

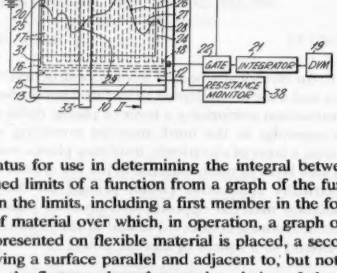


λ and I obtained while maneuvering said vehicle in said line of sight and lead collision courses.

3,906,190
APPARATUS FOR INTEGRATION AND AVERAGING

Leon Henry Light, London, England, assignor to National Research Development Corporation, London, England

Filed June 27, 1973, Ser. No. 374,066
Claims priority, application United Kingdom, June 30, 1972, 30790/72
Int. Cl.[2] G06K 11/02; G08C 21/00; H01H 43/08; G11C 11/44
U.S. Cl. 235—61.6 A 21 Claims



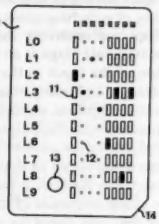
1. Apparatus for use in determining the integral between predetermined limits of a function from a graph of the function between the limits, including a first member in the form of a sheet of material over which, in operation, a graph of a function represented on flexible material is placed, a second member having a surface parallel and adjacent to, but not in contact with the first member, the members being of electrically conductive material and the sheet being of such material and so mounted that is able to deform temporarily and make contact with the said surface over a relatively small area when pressed towards the surface by stylus means used to follow the curve of the graph, means for applying a voltage across one of the members, and an integrating circuit coupled to the other member, the apparatus being such that if the axis of the independent variable of the graph is placed in a predetermined position, the two members can be so pressed into contact in following the curve that sample signals representing the dependent variable of the graph pass to the integrating circuit, and the said other member being so coupled to the integrating circuit that sample signals pass to the integrating circuit at increments of the independent variable which are equal to one another.

3,906,191

ELECTROMECHANICAL DEVICE FOR CHECKING THE VALIDITY OF PERFORATED CARDS

Claude Malavasi, Annecy, France, assignor to Daniel Lejone and Paul Monge, France

Filed June 4, 1973, Ser. No. 366,493
Claims priority, application France, June 2, 1972, 72.19963; May 29, 1973, 73.19554
Int. Cl. G06k 7/04, 5/04, 19/06
U.S. Cl. 235—61.11 C 13 Claims



1. An electromechanical device for checking the validity of perforated cards, said device comprising a mechanical reader, in which a card to be checked is received, for detecting the presence or absence of a perforation in each of the perforatable locations of the card by establishing or breaking pairs of electrical contacts individually associated with each of said locations, at least one posting system for at least one reference datum, an interrogation circuit for interrogating at least one validation datum entered on the card and for producing an output voltage responsive to said validation datum conforming to said reference datum, electromechanical means for retaining said card in said reader, and a utilization circuit responsive to the output of said interrogation circuit for controlling the release of the card by said electromechanical means, said utilization circuit comprising a first time delay relay which is supplied with direct current responsive to the introduction of a card in said reader for, in the inoperative state thereof, enabling energization of said interrogation circuit and said electromechanical means, a second time delay relay, having a time delay shorter than that of said first relay, for, in the operative state thereof, enabling energization of said interrogation circuit and said electromechanical means, and a third relay for inhibiting energization of said second relay responsive to said output voltage of said interrogation circuit, said device further comprising manually operated means for disconnecting said first and second relays, said interrogation circuit and said electromechanical means so as to cause release of a card from said reader.

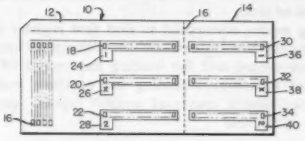
3,906,192

CARD USED ON ELECTRONIC COMPUTER FOR RECORDING AND COLLECTION OF DATA INTENDED FOR BETTING CONTESTS AND SIMILAR CONTESTS

Humberto Jose De Carvalho Cidade, Rua Tocantins, 8 Saco de Sao Francisco, Niteroi, Rio de Janeiro, Brazil

Filed Feb. 15, 1974, Ser. No. 442,842
Int. Cl.² G06K 19/06, 21/00
U.S. Cl. 235—61.12 R 1 Claim

1. A two part indicia bearing punch card for use in combination with an indicia bearing form for the recording of data, said card including a serration extending transversely thereof from one edge to the other to divide the card into first and second separable parts, said first part including a group of columns along its left hand edge which are pre-punched with control data information, the serration being sufficiently off-center so that when the card is folded along the serration the second part does not cover the columns of control data information, a plurality of rows of sapces in which information will ultimately be punched disposed beside said group of columns, each of said spaces bearing identifying indicia on one face of the unfolded card, the second one of said parts containing a mirror image of the spacing and arrangement of said plurality of rows of spaces and identifying indicia on said one face and in which information will be punched as appears on the first one of said parts, said indicia bearing form containing rows of spaces and identifying indicia identical to the rows of spaces



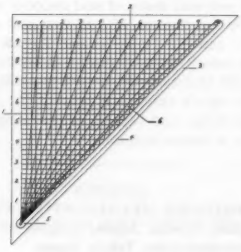
and identifying indicia appearing on each of the separable parts of said card, whereby upon folding said second part over said first part and placing said indicia bearing form over said folded parts a single punching operation performed on said indicia bearing form and said card will simultaneously record the desired data on both parts of the card to provide a duplicate and separable information record.

3,906,193

MATHEMATICAL CALCULATING

Thomas G. Packard, 23910 W. 74th Ave., Edmonds, Wash. 98020

Filed Feb. 8, 1971, Ser. No. 113,186
Int. Cl. G06c 3/00
U.S. Cl. 235—89 R 3 Claims



1. I claim an instrument of the character discribed comprising a member that has the shape of a triangle and the side of the triangle has a scale that is graduated from zero to ten or more by units with each unit of scale subdivided further and the upper portion of the triangle has a scale that is graduated from one to ten or more by units with each unit of the scale subdivided further and this scale is precisely fixed at the tenth major unit of the side scale at a ninety degree angle and the area of the triangle is a field of lines that are common with the graduations on each scale at a ninety degree angle and there are also a series of lines the number of which are equal to the number of unit graduations on the upper scale and these lines issue from the zero point on the side scale and consecutively intersect the unit graduations on the upper scale.

3,906,194

SIGNAL PROCESSOR

Douglas G. Fairbairn, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1973, Ser. No. 426,842
Int. Cl.² H03K 21/30
U.S. Cl. 235—92 MP 8 Claims

1. A processor for converting two sets of signals from a pair of shaft encoders, each set of which comprises a pair of signals

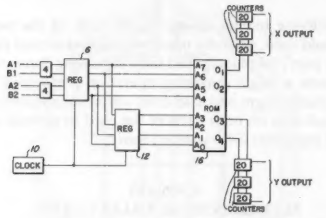
approximately 90° out of phase with one another, into two binary pulse trains respective to each encoder, comprising:

first register means for storing the state of said encoder signals for a given period of time,

said encoder signals respectively representing the X and Y positional coordinates of an indicator device,

second register means responsive to the output of said first register means for storing its output state during the same period of time,

clocking means connected to said first register means for loading the new state of said encoder signals into said first register means and for loading the output of said first register means representing the previous state of said encoder signals into said second register means each clock cycle, and



memory means responsive to the output states of said first and second register means for processing said states,

said memory means storing binary values which are accessed by the outputs of said register means whereupon said memory means is addressed in parallel by both the new and previous states of said encoder signals as represented by the outputs of said first and second register means to provide binary output signals in accordance with the binary values accessed indicative of the transitions in the states of said encoder signals,

said binary signals being indicative of the position of said indicator device and capable of providing cursor control signals to a display monitor.

3,906,195

SYNCHRONOUS MULTI-PURPOSE COUNTER

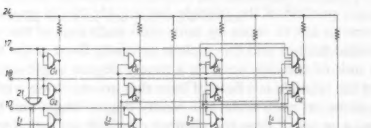
Tsugie Maejima, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Jan. 30, 1974, Ser. No. 438,046

Claims priority, application Japan, Feb. 9, 1973, 48-16176

Int. Cl.² H03K *23/08, 21/06*

U.S. Cl. 235—92 LG **13 Claims**



1. A synchronous multi-purpose counter comprising a plurality of flipflops each having a first input terminal, a second input terminal, an output terminal and a clock terminal, each of the flipflops forming a counter stage, each flipflop having its status and the output at its output terminal reversed in logical value each time a clock signal is applied to its clock terminal when inputs to both its first and second input terminals have the same first logical value and having its previous status and the logical value at its output terminal maintained when the inputs have the same second logical value, the flipflop being set to a status represented by the relative logical values of its inputs when the inputs to its first and second input terminals have mutually different logical values; a like plurality of first gates each associated with the respective flipflops and having at least one input connected to receive the respective outputs from the flipflops of all of preceding stages and having its output connected to the first input terminal of the flipflop of its associated stage; a like plurality of second gates each associated with the respective flipflops and having its output supplied to the first input terminal of the associated flipflop; a like plurality of switching gates each associated with the respective flipflops for receiving the signal to the first input terminal of the associate stage as an input thereto and for supplying an inversion of the input to the second input terminal of the associated stage; a plurality of auxiliary gates associated with the respective flipflops except the first stage and having its input connected with the output of the corresponding first gate for supplying to the second input terminal of the associated flipflop the same signal as that supplied to the first input terminal of the same flipflop; a source of clock signal connected with the clock terminals of all of the flipflops in common; a source of first gate signal for enabling the first and auxiliary gates in a counting operation; and a source of second gate signal for enabling the second and switching gates in an operation other than the counting operation.

3,906,196

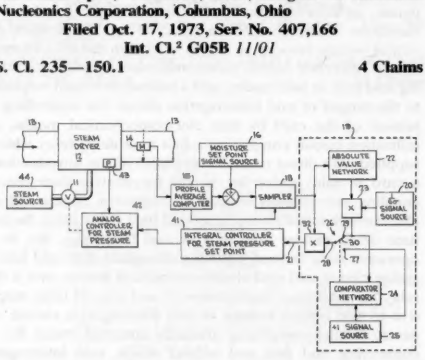
NON-LINEAR FEEDBACK CONTROLLER

David Allan Spitz, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Oct. 17, 1973, Ser. No. 407,166

Int. Cl.² G05B *11/01*

U.S. Cl. 235—150.1 **4 Claims**



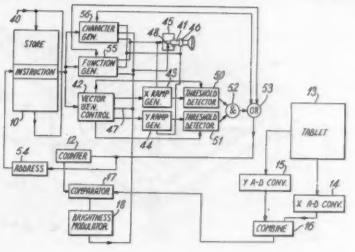
1. A system for controlling an output of an actuator, said output controlling a parameter to a setpoint value, comprising a feedback loop having an input responsive to a first signal indicative of the magnitude of the controlled parameter, said feedback loop including means for deriving an error signal indicative of the polarity and magnitude of the deviation of the first signal from the setpoint value, means responsive to the error signal for deriving a control signal having a magnitude that is a nonlinear continuous function of the deviation indicated by the error signal magnitude and has a polarity determined by the error signal indication of the polarity deviation, said control signal having a magnitude less than the magnitude indicated by the error signal for all error signal magnitudes indicative of the magnitude of the deviation being less than an assigned limit value except in response to the indicated deviation being equal to zero at which the control signal is zero, and means for energizing the actuator in response to the control signal, whereby noise normally introduced by the feedback means on the controlled parameter is substantially reduced by the nonlinear function, said control signal deriving means including means for maintaining the control signal a linearly increasing function of the deviation indicated by the error signal magnitude, instead of the nonlinear function, for error signal magnitudes indicating that the deviation is greater than the assigned limit value, said control signal deriving means

including means for deriving the control signal with a magnitude directly proportional to the square of the deviation indicated by the error signal within the deadband.

3,906,197
APPARATUS AND METHODS FOR COMPUTER GRAPHICS

Derrick John Grover, Roydon, England, assignor to National Research Development Corporation, London, England

Filed Mar. 5, 1974, Ser. No. 448,362
Claims priority, application United Kingdom, Mar. 9, 1973, 11433/73
Int. Cl.² G06K *15/20*
U.S. Cl. 235—151 **21 Claims**



1. Apparatus for carrying out spatial transforms, including a store for data,

display means, coupled to the store, for serially receiving items of data from the store and providing a display in accordance with the items received, each item being sufficient to allow the display means to provide a portion of the display,

means for identifying the items of data by providing an identifying signal associated with each item,

input means for generating signals representing the co-ordinates of selected points in a multi-dimensional region,

comparison means for comparing the signals representing the co-ordinates with the identifying signals to indicate if a predetermined correlation exists, and

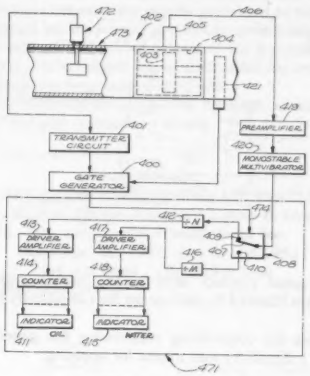
means, coupled to the comparison means, for emphasising those portions of the display displayed in accordance with items of data having the predetermined correlation with current signals derived from co-ordinates.

3,906,198
NET WEIGHT OIL COMPUTER OR THE LIKE

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 11, 1974, Ser. No. 514,222
Int. Cl.² G06G *7/75;* **G01F** *1/00*
U.S. Cl. 235—151.35 **18 Claims**

1. A net weight fluid computer for producing an output directly proportional to the total mass flow of at least one of first and second fluids flowing as a mixture in a pipeline, said computer comprising: first means connected with the pipeline for producing first pulses at a pulse repetition frequency directly proportional to the volume rate of total flow in the pipeline; second means connected with the pipeline for producing an output directly proportional to the average density d_m of the mixture in the pipeline; third means for producing an output directly proportional to the density d_o of the first fluid; fourth means for producing an output directly proportional to the density d_w of the second fluid; a switch having first input lead connected from said first means to receive said first pulses, said switch having at least one output lead connected therefrom, said switch having a second input lead and being electrically operable upon reciept of a pulse on said second input lead to change the connection between the first input and the output lead of said switch; and fifth means connected from said second, third and fourth means to receive the outputs thereof and adapted to impress second pulses on the second input lead of said switch to cause first pulses to be



passed and interrupted alternately from the first input lead to the output lead of said switch, said fifth means causing said second pulses to have a time width T_w, said fifth means causing said second pulses to be generated at a rate such that the time between the trailing edge of one second pulse and the leading edge of the next succeeding second pulse is T_t, said fifth means causing one of said times T_w and T_t to be equal to the following expression

$$K_1\left(\frac{1}{d_m}-\frac{1}{d_w}\right)$$

where K_1 is a constant that is positive when

$$d_w > d_o$$

and is negative when

$$d_o > d_w,$$

said fifth means causing the other of said times T_w and T_t to be equal to

$$K_1\left(\frac{1}{d_o}-\frac{1}{d_m}\right),$$

said switch having pulses appearing on said output lead thereof directly proportional, in number, to the total mass flow of said one fluid.

3,906,199
DIGITAL FILTER CIRCUIT

Robert Bruce Kieburtz, Fair Haven, and Kent Vincent Mina, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1974, Ser. No. 532,469
Int. Cl.² G06F *15/20, 7/39*
U.S. Cl. 235—152 **4 Claims**

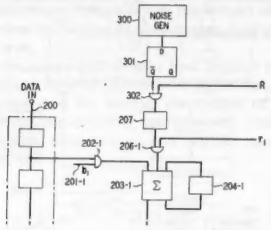
1. Apparatus in a digital filter for generating the product of an ordered N-bit binary data word and an M-bit multiplier word, M 2, comprising

A. M substantially identical stages, each comprising

1. means for forming the bitwise product of one bit of said multiplier word and each bit of said data word,
2. means for forming successive partial sums of said bitwise products and partial products of equal significance generated at a preceding stage, and
3. means for periodically blanking the one of said partia sums having lowest significance,

B. means for applying input partial sums generated at stage i to stage $i+1$ for $i = 1,2, \ldots M-1$, said input partial sum applied at stage 1 being uniformly 0, and

C. means for applying a logic 1 signal to said first stage of said multiplier at an interval such that it is ANDed with



the partial product term having highest significance which is blanked by said means for periodically blanking, and

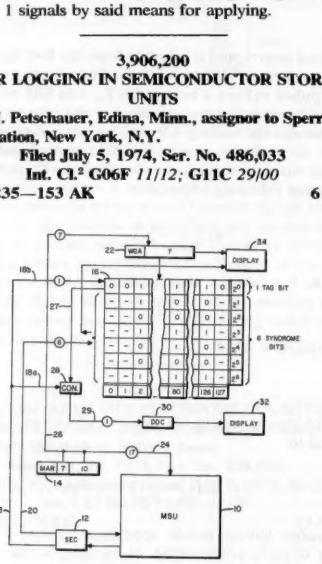
D. means for controllably suppressing the generation of logic 1 signals by said means for applying.

3,906,200

ERROR LOGGING IN SEMICONDUCTOR STORAGE UNITS

Richard J. Petschauer, Edina, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,033
Int. Cl.[2] G06F *11/12*; **G11C** *29/00*
U.S. Cl. 235—153 AK **6 Claims**



1. In a procedure for scheduling preventative maintenance in a memory system that is configured into N bit planes and B bits per bit plane, each bit plane being a replaceable component that is replaced upon the detection of a defective device or bit therein, the method comprising:

arranging an error logging store to be comprised of a plurality of memory registers, each memory register representing an associated different one of said bit planes;

generating, upon the detection of a defective device in each bit plane, an error word that is associated with the bit plane in which the defective device is detected, said error word comprising a single tag bit;

testing the bit that is stored in the tag bit position of the memory register that is associated with the bit plane with which the generated error word is associated;

storing said generated error word in its associated one memory register of said error logging store;

generating a defective device count only if said test indicates that an error has not previously occurred in the associated one of said bit planes;

incrementing a defective device counter only upon the generation of each of said defective device counts;

monitoring said defective device counter; and,

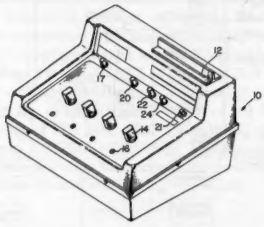
scheduling preventative maintenance of said memory system when said monitored defective device count reaches a predetermined magnitude.

3,906,201

MODULE CARD VERIFICATION SYSTEM

William A. Housman, Seattle, and Miklos B. Horvath, Redmond, both of Wash., assignors to William A. Housman, Seattle, Wash.

Filed Apr. 23, 1973, Ser. No. 353,457
Int. Cl.[2] G06K *7/06, 19/06*
U.S. Cl. 235—61.7 B **4 Claims**



1. A tamper-proof document validator for comparing memorized coded information with a pre-set code on a pre-coded document, comprising

a. a power source for providing a first potential;

b. a manually operated code input means electrically connected with said power source for receiving memorized coded information corresponding in a predetermined manner with the pre-set code of said pre-coded document, said code input means including

1. a plurality of output contacts, and

2. a plurality of input switches manually adjustable to correspond with the memorized coded information code for applying said first potential to selected output contacts if and only if said switches are adjusted to correspond with the memorized code;

c. modular validating circuit means connected with said power source for comparing the preset code of the document with the condition of said input switches to produce a first signal upon detecting a pre-determined correspondence between the adjustment of said input switches and the pre-set code of said pre-coded document and for producing a second signal upon detecting the lack of a pre-determined correspondence between the adjustment of said input switches and the pre-set code of said pre-coded document, said modular validating circuit means including

1. first and second sets of input contacts adapted to be electrically connected with the pre-coded document and the output contacts of said manually operated code input means respectively,

2. a plurality of logic gates, each said gate having a pair of inputs,

3. a first set of conductors electrically connecting each said input contact of said first set of input contacts with one input of each said logic gate respectively,

4. a second set of conductors connecting each said input contact of said second set of input contacts with the other input of each said logic gate respectively, and

5. potting means for encompassing and integrating said logic gates and said first and second sets of conductors into a single replaceable modular structure, whereby the memorized coded information necessary for obtaining a first signal indicative of valid correspondence between a pre-coded document and manually entered memorized code information may be changed by re-

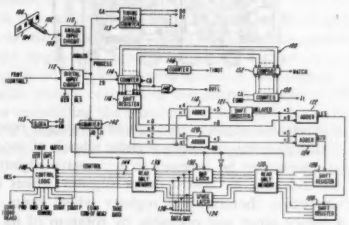
placing a modular validating circuit means having first and second sets of conductors arranged to interconnect different input contacts of said first and second sets of input contacts with said inputs of said logic gates.

3,906,202

DATA RETRIEVAL AND ERROR DETECTION METHOD AND APPARATUS DESIGNED FOR USE IN A WIDTH-MODULATED BAR-CODE SCANNING APPARATUS

Thomas A. Meyer, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 1, 1974, Ser. No. 447,117
Int. Cl.[2] G06K *7/14, 19/06*
U.S. Cl. 235—61.11 E **5 Claims**



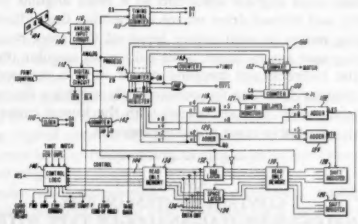
1. In a bar code scanning apparatus for scanning width modulated bar code characters each of which comprises a series of bars and spaces and including a manually-positionable scanning stylus, the improvement which comprises means for decoding the elements of a bar code character which is scanned by said stylus, and means for providing an error indication when the velocity with which said stylus scans one of said characters changes by more than a predetermined amount.

3,906,203

DATA RETRIEVAL AND ERROR DETECTION CIRCUITRY FOR A WIDTH-MODULATED BAR-CODE SCANNING APPARATUS

Arnis G. Butulis, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sept. 20, 1973, Ser. No. 399,773
Int. Cl.[2] G06K *7/10;* **G08C** *9/06*
U.S. Cl. 235—61.11 E **14 Claims**



1. An apparatus for reading width-modulated bar codes comprising:

means for generating a time-varying signal whose fluctuations correspond to the spatial fluctuations in said bar code;

timing means for generating a signal representation of a number proportional to the amount of time which elapses between successive fluctuations in said signal;

a shift register having an input connected to said signal representation and having a plurality of outputs from successive internal stages;

means for loading a signal representation into said shift register each time there is a fluctuation in said signal;

arithmetic means having inputs connecting to said outputs and having an arithmetic output for generating at said arithmetic output a signal representing the sum of or difference between the signals presented to said inputs;

comparison means having two inputs connecting to two of said outputs and having an output for generating at said output a binary signal whose state indicates which of two inputs is the larger or smaller; and

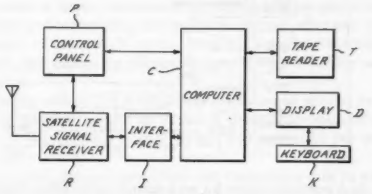
a second shift register connected between one of said outputs and said comparison means.

3,906,204

SATELLITE POSITIONING APPARATUS

James W. Rigdon; Saburo Ifune, and LeRoy D. Graber, all of Houston, Tex., assignors to Seiscom Delta Inc.

Filed Apr. 20, 1973, Ser. No. 352,953
Int. Cl. G06f *15/50;* **G01s** *5/00*
U.S. Cl. 235—150.27 **10 Claims**



1. An apparatus for processing data, sent from a satellite in the form of a fixed frequency signal containing phase modulated pulse doublets or orbit definition data, to determine a position of a vehicle on the earth, comprising:

a. receiver means for receiving the signal from the satellite, said receiver means comprising:

1. intermediate frequency means for domodulating the fixed frequency signal for processing;

2. phase detector means for determining the phase of the demodulated signal from said intermediate frequency means;

3. phase lock loop means receiving an output of said phase detector means for regulating the frequency of said intermediate frequency means;

4. doppler demodulator means responsive to an output of said phase lock loop means for determining the doppler shift in frequency of the signal sent from the satellite;

5. local oscillator means for forming a reference frequency signal;

6. synthesizer means for forming demodulating frequency signals for said intermediate frequency means, said phase detector means, and said doppler demodulator means from said reference frequency signal;

7. bit phase detector means for determining the phase of the orbit definition data phase doublets;

8. bit rate phase lock loop means for controlling the phase of the orbit definition data pulse doublets; and

9. data decoder means for decoding the orbit definition data from the phase modulated pulse doublets;

b. computer means for processing the doppler shift and orbit definition data to determine the location of the vehicle;

c. interface circuit means for providing the doppler shift and orbit definition data to said computer means, said interface circuit means including doppler counter means for counting the doppler shift; and

d. display means for indicating the location of the vehicle determined by said computer means.

3,906,205

ELECTRICAL FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

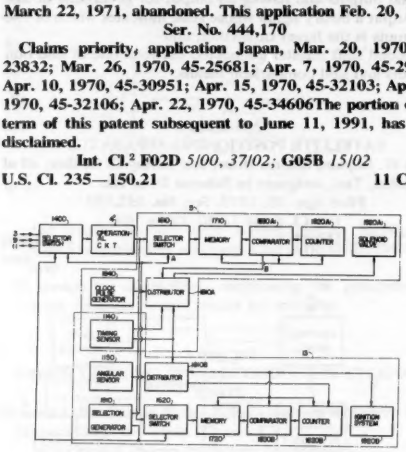
Hiroshi Yoshida; Noriyoshi Ando, and Kazuo Oishi, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 327,603, Jan. 26, 1973, Pat. No. 3,816,717, which is a continuation of Ser. No. 126,830, March 22, 1971, abandoned. This application Feb. 20, 1974, Ser. No. 444,170

Claims priority, application Japan, Mar. 20, 1970, 45-23832; Mar. 26, 1970, 45-25681; Apr. 7, 1970, 45-29684; Apr. 10, 1970, 45-30951; Apr. 15, 1970, 45-32103; Apr. 15, 1970, 45-32106; Apr. 22, 1970, 45-34606The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.

Int. Cl.[2] F02D *5/00*, *37/02*; G05B *15/02*

U.S. Cl. 235—150.21 11 Claims



1. A control system for an internal combustion engine comprising:

first sensor means for producing a first digital signal responsive to a first parameter of the engine condition,

first discriminating means, connected in circuit with said first sensor for detecting one of a plurality of predetermined first parameter ranges which includes said first parameter as represented by said first digital signal, and producing a number of output signals as determined by said detected first parameter range;

second sensor means for producing a second digital signal responsive to a second parameter of the engine condition, second discriminating means connected in circuit with said second sensor for detecting one of a plurality of predetermined second parameter ranges which includes said second parameter as represented by said second digital signal, and producing a number of output signals as determined by said second parameter ranges;

shifted code setting circuit means for shifting an input digital code signal applied thereto,

selecting means connected to said first and second discriminating means for selecting an input signal applied thereto in accordance with the output signals of said first and second discriminating means,

first circuit means connected to said first and second sensor means and including said shifted code setting circuit means and said selecting means for producing coded digital signals in codes which are obtained by subjecting said first and second digital signals to shifting and selecting operations by said shifted code setting circuit means and said selecting means in accordance with the output signals of said first and second discriminating means,

second circuit means, connected to said first circuit means and including an adder and a memory, for producing a digital control signal by adding the coded digital signal outputs of said first circuit means;

command signal generating means, connected to said second circuit means, for producing command signals to control a set-reset operation of said memory in the time sharing manner,

third circuit means connected to said second circuit means for producing a drive signal in accordance with said digital control signal of said second circuit means; and

electrically actuating means connected to said third circuit for operating in accordance with the drive signal of said third circuit means.

3,906,206

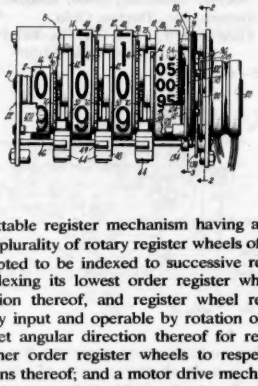
RESETTABLE REGISTER MECHANISM

Bruno S. Smilgys, Hartford, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed June 3, 1974, Ser. No. 475,759

Int. Cl.[2] G06C *15/42*

U.S. Cl. 235—144 ME 9 Claims



1. In a resettable register mechanism having a resettable register with a plurality of rotary register wheels of ascending order and adapted to be indexed to successive registrations thereof by indexing its lowest order register wheel in one angular direction thereof, and register wheel reset means having a rotary input and operable by rotation of its rotary input in a reset angular direction thereof for resetting the remaining higher order register wheels to respective reset angular positions thereof; and a motor drive mechanism connected to the lowest order register wheel and operable for indexing the lowest order register wheel in its said one angular direction for indexing the register to successive registrations thereof, the improvement wherein the motor drive mechanism comprises a bidirectional electrical rotary stepping motor adapted to be selectively angularly stepped in each angular direction thereof, first drive means connecting the bidirectional rotary stepping motor to the lowest order register wheel for indexing the lowest order wheel in each angular direction thereof with the stepping motor in accordance with the angular direction and number of steps of operation of the stepping motor whereby the rotary stepping motor is adapted to be selectively electrically stepped in one angular direction thereof for selectively indexing the lowest order register wheel in its said one angular direction for selectively indexing the register to successive registrations thereof and to be selectively electrically stepped in a reverse reset angular direction thereof for indexing the lowest order counter wheel in an opposite reset angular direction to a reset angular position thereof, and second drive means connecting the bidirectional stepping motor to said rotary input of the reset means for indexing said rotary input in its said reset angular direction with the bidirectional stepping motor as it is stepped in its reset angular direction for concurrently resetting the remaining higher order register wheels with the lowest order wheel to their respective reset angular positions.

3,906,207

CONTROL SYSTEM OF THE ANALOGUE-DIGITAL-ANALOGUE TYPE WITH A DIGITAL COMPUTER HAVING MULTIPLE FUNCTIONS FOR AN AUTOMOBILE VEHICLE

Jean-Pierre Rivere; Bernard Bertuol, and Claude Leichle, all of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed May 10, 1973, Ser. No. 358,963

Claims priority, application France, May 10, 1972, 72.16823; Oct. 21, 1972, 72.38208

Int. Cl.[2] G06F *15/50*; G01M *15/00*

U.S. Cl. 235—150.2 14 Claims

1. An analog-digital-analog control system for controlling control devices on an engine, comprising: detecting means

coupled to said engine for detecting engine performance data of more than one type;

analog-to-digital conversion means coupled to said detecting means for converting analog signals representing detected engine performance data into corresponding digital signals;

read-only memory means for storing predetermined reference data relating to said detected data;

calculating means coupled to said analog-to-digital conversion means and to said read-only memory means for calculating engine control signals from said reference and detected data;

multiplexing means coupled to said analog-to-digital conversion means and said calculating means for selecting one type of engine performance data from among said more than one type for calculation in said calculating means;

clock means for generating a plurality of clock pulses;

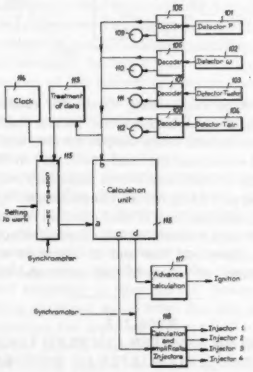
synchronizing means coupled to said clock means and to said engine for synchronizing the output of said clock means with the rotational speed of said engine;

counter means coupled to the output of said clock means for controlling the sequence of calculations performed by said calculating means, said counter means being incremented by said clock means output at least once during each engine revolution to initiate a predetermined calculation sequence between two successive counter increments; and

digital-to-analog conversion means coupled to said calculating means and to said engine control devices for converting digital control signals generated by said calculating means into corresponding analog signals for controlling said engine;

wherein said calculating means comprises multiplying means for multiplying two members each having a maximum of 10 binary digits, adding means for adding two numbers each having a maximum of 10 binary digits, and a read/write memory coupled to said adding means for storing an output of said adding means; and

said multiplexing means comprises first and second multiplexers coupled to inputs of said multiplying means for multiplying said numbers to be multiplied, third and fourth multiplexers for multiplexing said numbers to be added, second and third read/write memories coupled between outputs of said third and fourth multiplexers and inputs of said adding means, and means coupling said read/write memories to said counter means for controlling the read/write operation of said memories by the output of said counter means.



3,906,208

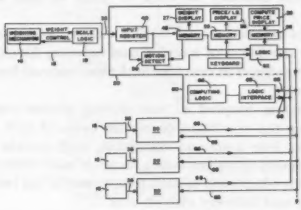
COMPUTING SCALE SYSTEM

Robert M. Rogers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 29, 1974, Ser. No. 464,767

Int. Cl.[2] G01G *19/413*; **G06F** *15/20*

U.S. Cl. 235—151.33 **20 Claims**



1. A computing scale system comprising

a plurality of scales for weighing articles at diverse locations,

a plurality of display units each corresponding to one of said scales and comprising means for entering a price per unit weight of an article being weighed on the associated scale, and means for displaying a computed value for said article,

computing means for multiplying a measured weight by a price per unit weight to obtain a computed value of an article represented by said weight and said price per unit weight,

transmission means connecting said computing unit to said scales and said display units on a time sharing basis, so that said computing unit computes the article values required for display by each of said display units and transmits said values back to the correct displays,

display unit address means adjustable for generating display unit addresses designating different ones of said display units and connected for transmitting said addresses on a sequential basis over said transmission means to said display units, and

decoding means associated with each of said display units and connected to said transmission means for enabling communicating of a display unit with the computing means only when its associated decoding means has received the address which designates said display unit.

3,906,209

WRONG ADDRESSING DETECTOR

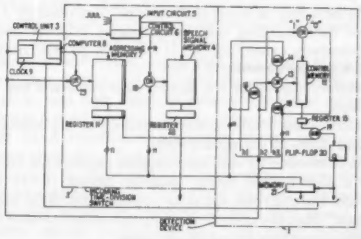
Raymond Bakka, Boulogne, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 480,079

Claims priority, application France, July 18, 1973, 73.26286

Int. Cl.[2] G06F *11/00*; **G11C** *29/00*

U.S. Cl. 235—153 AM **5 Claims**



1. An arrangement for detecting the occurrence of identical binary words within given time intervals, each of said time intervals having a duration equal to the duration of a predeter-

mined cycle duration comprising n elementary times, where n is an integer greater than one, comprising:

a delivering circuit recurrently delivering at each elementary time a binary word selected out of n binary words, each of said binary words including the same number of bits;

storing means coupled to said delivery circuit for alloting an individual memory location to each of said n binary words;

first means coupled to said storing means capable of changing the condition of each of said memory locations into a first condition at one identical time interval for each of said cycles;

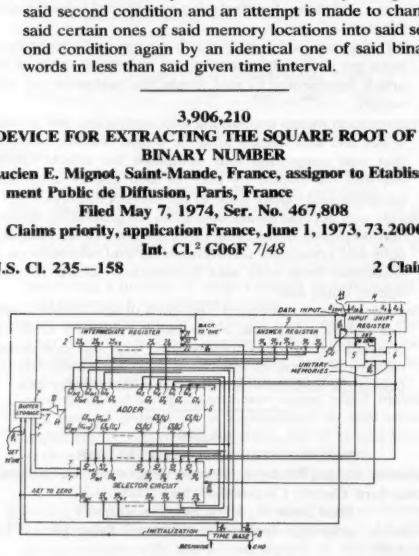
second means coupled to said storing means capable of changing the condition of certain ones of said memory locations into a second condition, said certain ones of said memory locations being those of said memory locations into which one of said binary words has been delivered by said delivery circuit; and

detection means coupled to said storing circuit to determine the condition of said certain ones of said memory locations as soon as one of said binary words is delivered thereto and before the condition of said certain ones of said memory locations can be changed to said second condition and to provide an error signal when said certain ones of said memory locations have already changed to said second condition and an attempt is made to change said certain ones of said memory locations into said second condition again by an identical one of said binary words in less than said given time interval.

3,906,210
DEVICE FOR EXTRACTING THE SQUARE ROOT OF A BINARY NUMBER

Lucien E. Mignot, Saint-Mande, France, assignor to Etablissement Public de Diffusion, Paris, France

Filed May 7, 1974, Ser. No. 467,808
Claims priority, application France, June 1, 1973, 73.20009
Int. Cl.² G06F 7/48
U.S. Cl. 235—158 **2 Claims**



1. Apparatus for the extraction of the square root of a given binary number having 2(n+1) digits, comprising:

means including an input shift register controlled by a time base for recording said given binary number and for successively extracting (n+1) two-digit groups from said given binary number;

two unitary memories for storing said extracted two-digit groups;

an intermediate shift register recording in succession the found digits of the square root;

means controlled by said intermediate register for building up a first further binary number having (n+3) digits which, starting from the zero weight binary digit, are two "ones", then the complements to the already found digits of the square root, and finally ones;

an adder adding said first further binary number to a second further binary number;

a selector circuit receiving a first auxiliary binary number from said adder and a second auxiliary binary number;

said second further binary number being formed by the output number from said selector circuit, the digits of which have been shifted two binary places to the upper weight end and the two digit places on the zero weight end of which are a group of two digits of said given binary number which is received from said unitary memories;

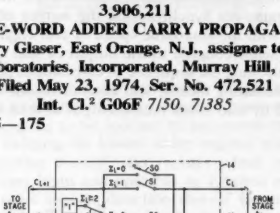
said selector circuit including means for selecting said first auxiliary number from said adder when the last preceeding found digit of the square root is a one and also including means for selecting said second auxiliary number when the last preceeding found digit of the square root is a "zero"; and,

means for feeding the successive carry forwards of the addition from the adder to said intermediate register whereby the digits of the wanted square root are obtained as these successive carry forwards in addition to said first and second further binary numbers.

3,906,211
THREE-WORD ADDER CARRY PROPAGATION

Arthur Barry Glaser, East Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 23, 1974, Ser. No. 472,521
Int. Cl.² G06F 7/50, 7/385
U.S. Cl. 235—175 **22 Claims**

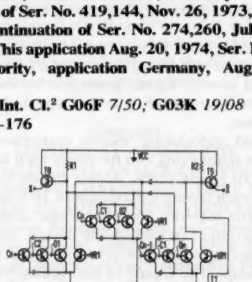


1. An adder stage comprising means for receiving a first group of at least three summand bits, means for receiving a plurality of carry-in bits, carry output means, and means responsive to said summand bits and said carry-in bits for providing an plurality of carry-out bits to said carry output means, said carry-out bit providing means characterized by means for routing at least a selected one of said carry-in bits to said carry output means in accordance with a scheme allocating equal weights to said carry-out bits and in response to predetermined combinations of values of said summand bits.

3,906,212
SERIES-COUPLED EMITTER COUPLED LOGIC (ECL) CIRCUIT HAVING A PLURALITY OF INDEPENDENTLY CONTROLLABLE CURRENT PATHS IN A LOWER PLANE

Dieter Poguntke, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 419,144, Nov. 26, 1973, abandoned, which is a continuation of Ser. No. 274,260, July 24, 1972, abandoned. This application Aug. 20, 1974, Ser. No. 498,967
Claims priority, application Germany, Aug. 18, 1971, 2141415
Int. Cl.² G06F 7/50; G03K 19/08
U.S. Cl. 235—176 **2 Claims**



1. In a series-coupled emitter-coupled logic circuit of the type having a first differential amplifier in a lower plane and second differential amplifiers in an upper plane, wherein the first differential amplifier includes a plurality of first transis-

tors each having a base, an emitter and a collector, the emitters connected together for connection to a constant current supply, the base of one of said first transistors connected to a reference potential and the bases of the other first transistors serving to receive respective input signals of a first group of input signals for independently controlling the current paths through the respective transistors, wherein each second differential amplifier includes a pair of second transistors each having a base, an emitter and a collector, the emitters of each pair of second transistors connected to the collector of a respective controllable first transistor of the first differential amplifier, the base of one second transistor of each pair connected to a reference potential and the base of the other second transistor of each pair serving to receive a respective input signal of a second group of input signals for independently controlling the current paths through the respective transistors, wherein a first collector resistor connects the collectors of the controllable second transistors of the second differential amplifiers in the upper plane to an operating potential and a second collector resistor connects the collectors of the reference one first transistor in the lower plane and the referenced one second transistor of each second differential amplifier in the upper plane to the operating potential, wherein a first output transistor operates as an emitter follower for the controllable second transistors in the upper plane and a second output transistor operates as an emitter follower for the referenced transistors in the upper and lower planes, the first output transistor having a base connected in common with the collectors of the controllable transistors in the upper plane and to the first collector resistor, an emitter serving as a first output, and a collector connected in common with the first collector resistor and the operating potential, the second output transistor having a base connected in common with the collectors of the referenced transistors in the upper and lower planes and to the second collector resistor, an emitter serving as a second output, and a collector connected to the second collector resistor and to the operating potential, the improvement therein comprising:

at least one additional second transistor in each second differential amplifier of the upper plane, each said additional second transistor having an emitter connected to the other emitters of the respective second differential amplifier and a collector connected to the collector of a controllable second transistor of the respective second differential amplifier to form an OR linkage, and a base for receiving an input signal from the first group of input signals, wherein the input signals applied to the bases of the additional second transistors excludes the input signal of the first group applied to the base of the respective controllable transistor which has its collector connected to the emitters of the respective second differential amplifier.

3,906,213
CORRELATION SYSTEM FOR DELAY MEASUREMENT

Claude Meriaux, and Jacques Aime, both of Paris, France, assignors to Thomson-CSF, Paris, France

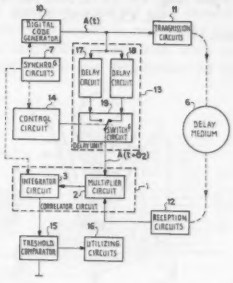
Filed Mar. 21, 1974, Ser. No. 453,636

Claims priority, application France, Mar. 27, 1973, 73.10945

Int. Cl.[2] G06G 7/19; G01S 9/12

U.S. Cl. 235—181 **7 Claims**

1. A correlation system for delay measurements between two signals in a determined delay measurement zone comprising, generating means for providing an original signal and reference signals; means for transmitting said original signal through a delay medium; means for receiving said transmitted original signal and for delivering a corresponding reception signal; correlating means for correlating during a determined integration duration said reception signal with said reference signals; and utilization means fed by said correlating means and comprising threshold comparison means; said generating means comprising delay means for providing a plurality *n* of signals corresponding to said original signal delayed by *n* separate determined delay values respectively, and selection means for selecting in succession said *n* delayed signals during *n* respective determined separate durations the sum of which



being at most equal to the said integration duration, said selection means delivering said reference signals formed by said *n* successively selected delayed signals.

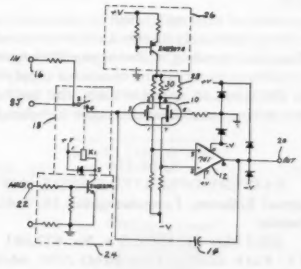
3,906,214
SIGNAL RETAINING ANALOG INTEGRATOR APPARATUS

Richard F. Hess, Phoenix, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 29, 1973, Ser. No. 420,331

Int. Cl. G06g 7/18

U.S. Cl. 235—183 **8 Claims**



1. A D.C. biased signal retaining analog integrator apparatus comprising in combination:

a high input impedance integrator means to receive an input signal, said high input impedance integrater means integrating said input signal to provide an output signal,

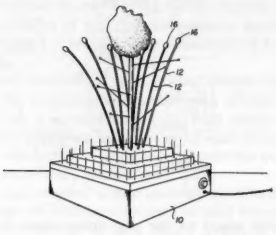
a current source connected to said high input impedance integrator means to supply a constant current to said high input impedance integrator means, and,

a control means connected to said high input impedance integrator means, said control means controlling the input to said high input impedance integrator means to provide a hold function for the output signal within said high input impedance integrator means, said control means receiving a hold signal, said control means being responsive to said hold signal, said control means disconnecting said input signal from said high input impedance integrator means in response to said hold signal, said control means controlling said high input impedance integrator means to retain said output signal in response to said hold signal, said high input impedance integrator means maintaining said output signal during loss of the DC bias voltages.

3,906,215
DECORATIVE DEVICE

Frank Peter Dinicola, 94 Bushwick Ave., Central Islip, N.Y. 11722

Filed Aug. 19, 1974, Ser. No. 498,516
Int. Cl.[2] A47G *33/16*
U.S. Cl. 240—10 R **2 Claims**

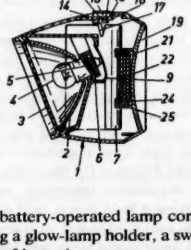


1. A decorative device comprising:
a horizontal base;
a rigid vertical member extending upwardly from the base; a large ball of foil surmounting the top end of the rigid member to resemble a part of a plant;
a plurality of hollow elongated upwardly extending yieldable solid members secured at their bottom ends to the base and having open top ends, said yieldable member resembling the stalks of a plant and cooperating visually with the rigid member and foil to resemble a plant;
a like plurality of incandescent lamp sockets, each socket being disposed in a top open end of a corresponding member and extending along the longitudinal direction thereof;
a like plurality of extremely small incandescent lamps, each lamp being removably disposed in a corresponding socket and likewise extending in the longitudinal direction of the corresponding member; and means for supplying electricity to the lamps to energize them, the means including electric wiring in the base and in the individual members.

3,906,216
BATTERY-OPERATED HAND LAMP

Albert Samuel Eriksson, Langakersgatan 16, S-442 00 Kungalv, Sweden

Filed May 21, 1974, Ser. No. 472,061
Int. Cl.[2] F21V *33/00, 21/00;* **F16G** *3/00;* **A61B** *1/06*
U.S. Cl. 240—6.4 W **7 Claims**

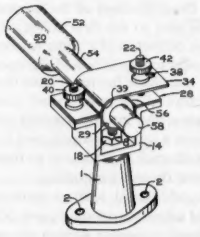


1. An improved battery-operated lamp comprising
a casing enclosing a glow-lamp holder, a switch, a reflector, and a number of batteries,
means arranged at a back side of said casing for closing off said casing, said means including a lid,
strap means for serving as a means for attaching said lamp to the head of a user, said strap means comprising a belt, band, or the like, and
the improvement comprising means for defining an elongate space in said lid, said space for receiving said strap means therein,
means defining an opening for passage of said strap means therethrough said opening positioned between two opposite surfaces on said casing and on said lid respectively, whereby upon use of said strap means for attaching said lamp to the head of a user a portion thereof may extend out through said opening to form a loop, a first end portion of said strap means being securely fixed to one end of said lid and a second end portion of said strap means being attached to the lid in a manner permitting adjustment of the strap means in the longitudinal direction thereof, and
means for retaining said strap means in its adjusted position by squeezing said second end portion thereof between said lid and said casing.

3,906,217
LAMP MOUNTING BRACKET

James Kneeland Lackore, Mount Prospect, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 14, 1974, Ser. No. 451,253
Int. Cl.[2] H05B *33/02;* **F21V** *21/08;* **H01R** *33/08, 33/10*
U.S. Cl. 240—51.11 **15 Claims**



1. A lamp mounting bracket comprising
A. a base;
B. electrically conductive compression means for engaging portions of the cylindrical surface of an electrically conducting cylindrical mounting lug of a lamp; and
C. means for loosely retaining said electrically conductive compression means to said base so that said electrically conductive compression means can freely move with respect to said base in a direction parallel to the axis of said electrically conductive cylindrical mounting lug without disengaging said mounting lug.

3,906,218
DIGITAL FILTERS

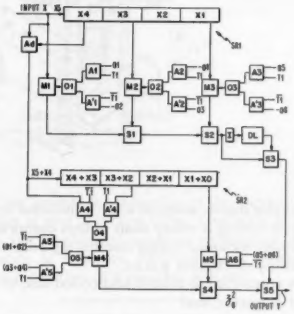
Henri J. Nussbaumer, La Gaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1974, Ser. No. 529,170
Claims priority, application France, Dec. 28, 1973, 73.47206
Int. Cl.[2] G06F *7/38, 15/34*
U.S. Cl. 235—156 **3 Claims**

1. An electrical filter of the sampling type wherein each output signal sample is derived from a plurality of weighted earlier input signal samples, said filter characterized by having:
a. a first means for forming a main term, said first means including:
i. summing means for adding the value of each input signal sample to that of the preceding input signal sample;

ii. storage means for temporarily storing at least the last n sums provided by said summing means;
iii. readout means for providing the value of every second sum temporarily stored by said storage means;
iv. means for weighting every second sum provided by said readout means, by alternatively using the sums of even order to form a first output sample and the sums of odd order to form a second output sample; and
v. means for adding together the sums weighted by said weighting means and associated with the output signal sample being derived;

b. a second means for forming a corrective term, including:
i. a second storage means for temporarily storing the last n signal samples applied to the input of said filter;
ii. another means for providing the value of every second sample temporarily stored in said second storage;
iii. product means for weighting the values of the samples provided by said another means, by alternately using a



first set of coefficients selected from the coefficients of the filter to be realized while forming a third output signal sample and a second set of coefficients while forming the fourth output sample;
iv. adder means for adding together the samples weighted by said product means while forming each output signal sample;
v. a last storage means for storing the result of the operation performed by said adder means when the output sample preceding the sample being processed was generated; and
vi. means for inverting the content of said last storage means and adding the inverted content to the term provided by said adder means; and

c. another adder means for adding together said main term and said corrective term provided by said first and second means, respectively, to provide a filtered output signal sample.

3,906,219
FOCUS DETECTING APPARATUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

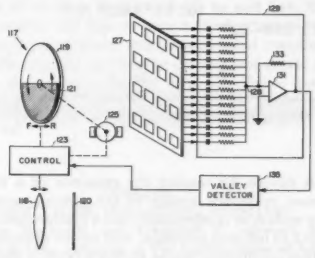
Filed Oct. 9, 1973, Ser. No. 404,318
Int. Cl. G01j *1/36*
U.S. Cl. 250—204 **5 Claims**

1. A focus condition detecting apparatus for use in focussing an image of an object, comprising

light sensing means including a plurality of light sensing elements spatially distributed in an array in a given plane, each of said elements providing an electrical signal representative of the intensity of light falling thereon,

optical means having a central axis and an entrance pupil and positioned to form on said plane, over an optical path through said pupil, a light image of said object,

cyclically operated light gating means comprising an opaque mask positioned substantially at said optical means and arranged to be rotated about said central axis of said optical means and further arranged, when so rotated, to cylically block successive spatially separate areas of said entrance pupil of said optical means, to cause light from said object to reach said sensing means cylically from said spatially separate areas and to cause said image and hence the distribution of light to shift



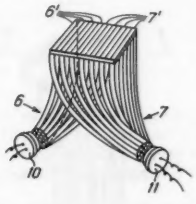
cyclically over said array of sensing elements to an extent dependent upon the extent to which said image is out of focus on said plane, said image and light distribution remaining substantially stationary on said array of sensing elements, notwithstanding said cyclic operation of said gating means, when said image is in focus on said plane, and

means connected to said sensing elements and responsive to said signals to provide an output signal representative of the condition of focus of said image on said plane.

3,906,220
OPTICAL CORRELATOR

Eckart Delingat, Hermannstein, Germany, assignor to Ernst Leitz G.m.b.H., Germany

Filed Nov. 19, 1973, Ser. No. 417,203
Claims priority, application Germany, Dec. 8, 1972, 2260086
Int. Cl.[2] G01D *5/26*
U.S. Cl. 250—227 **13 Claims**



1. In an optical correlator having an imaging lens, at least one optical device for filtering out image structures with specific spatial frequencies for determining the respective relative spatial position of an object, and a photoelectric receiver system having at least one receiver and coordinated to said optical device and generating electrical signals corresponding to the relative position between an image of said object and said optical device, said electrical signals conducted to a control system, the improvement comprising said optical device comprising an image divider having a plurality of optical fiber bundles arranged in groups, each group having a front face, in combination with the front faces of other fiber bundle groups forming an optical grating, and each said group having a rear end associated with a receiver of said receiver

systems, the ends of a plurality of bundle groups, the front faces of which are not lying side by side, are associated with one receiver.

3,906,221

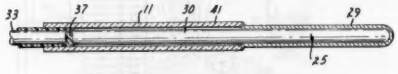
PROOF OF IGNITER AND FLAME SENSING DEVICE AND SYSTEM

Gary M. Mercier, 3212 Florida Ave. South, St. Louis Park, Minn. 55426

Filed Dec. 10, 1973, Ser. No. 423,168

Int. Cl.[2] G02B *5/14*

U.S. Cl. 250—227 **10 Claims**



1. A device for sensing the presence of a flame and an electrical resistance igniter in the igniting mode in a fuel burner system in combination with a photoresponsive element sensitive to infrared radiation, said device comprising infrared radiation-conducting means having a portion thereof adapted to be located directly within said flame, ceramic cover means associated with and substantially enclosing said portion of said infrared radiation-conducting means, said ceramic cover means being heat stable, visible light opaque, transparent to the passage of infrared radiation emitted by said igniter through said cover means whereby said igniter is sensed by said photoresponsive element and further said cover means emitting infrared radiation upon excitation by a flame whereby said flame is sensed by said photoresponsive element.

3,906,222

ELECTRICAL PUSH-BUTTON SWITCH WITH PHOTO-ELECTRICAL SWITCHING ELEMENTS

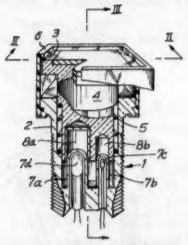
Paul Georges Astier, La Seyne-sur-Mer, and Pierre Canaby, Sainte-Anne Toulon, both of France, assignors to Etat Francais, Paris, France

Filed Nov. 20, 1974, Ser. No. 525,651

Claims priority, application France, Nov. 22, 1973, 73.41527

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—229 **10 Claims**



1. An electric switch comprising a push button, a casing slidably supporting the push button, said casing having a bottom, resilient means acting on the push button and casing to bias the push button to a raised position away from the bottom of the casing, said casing including two hollow portions facing one another and constituted of transparent material, a light source in one hollow portion and a photo-electric element in the other hollow portion, and means on said push button for blocking communication between said light source and photo-electric element when the push button is depressed to an operative position, said hollow portions being constituted by two housings projecting from the bottom of the casing and made of transparent plastic material.

3,906,223

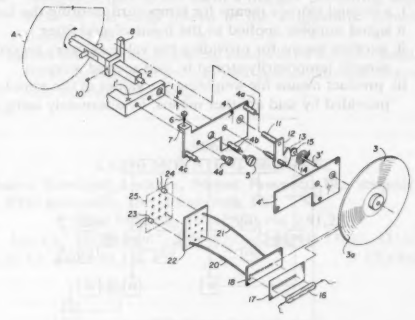
ENCODER FOR ALTIMETERS

Robert E. White, Westbury, N.Y., assignor to Victor E. Carbonara, Inc., Port Washington, N.Y.

Filed June 12, 1974, Ser. No. 478,439

Int. Cl.[2] G01L *7/12*

U.S. Cl. 250—231 SE **3 Claims**



1. Encoder means adapted to be connected to an altimeter of the type having a rotary shaft output comprising,

a rotatably mounted coded disc having code markings on a plurality of circular tracks,

means connected to couple said coded disc to the output of said altimeter, and

means to read a code on said disc comprising a plurality of fiber optic cables,

the input ends of said cables being located on one side of said disc and spaced so that each cable is adapted to read code markings on one of said circular tracks,

a light source on the other side of said disc,

and a plurality of photo-sensors, each photo-sensor being located to read the output of one of said filter optic cables,

said coupling means comprising means to adjust the motion of said disc to the full range rotation of the altimeter output shaft,

said adjusting means comprises an encoder drive arm mounted on the altimeter output shaft,

an adjustment member pivotally mounted on the altimeter frame,

an encoder drive pin rotatably mounted on said adjustment member, said drive pin being in drivable contact with said encoder drive arm,

said encoder drive pin being connected to rotate said disc.

3,906,224

DUAL SPACED EPITHERMAL NEUTRON DETECTOR POROSITY LOGGING WITH ACBE SOURCE

Hubert Dunkerley Scott, and Michael Paul Smith, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 254,282, May 17, 1972, Pat. No. 3,774,033. This application Oct. 12, 1973, Ser. No. 406,124The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Int. Cl. G01t *3/00*

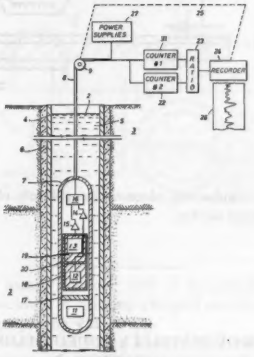
U.S. Cl. 250—264 **9 Claims**

1. A method for measuring the porosity of earth formations in the vicinity of a well borehole comprising the steps of:

irradiating the earth formations in the vicinity of the borehole with fast neutrons from a relatively high intensity actinium-beryllium neutron source;

detecting essentially only the epithermal neutron population at a first spaced distance from said source in the borehole;

detecting essentially only the epithermal neutron population at a second different spaced distance from said source in the borehole;



discriminating against the detection of the thermal neutron population at said detectors in the borehole; and

combining the epithermal neutron population measurements made at said two different spaced distances to derive an indication of formation porosity.

3,906,225

X-RAY SPECTROMETER

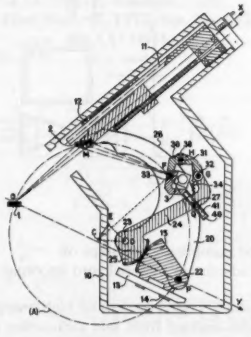
Jacques Guernet, and Pierre Boissel, both of Courbevoie, France, assignors to Compagnie d'Applications Micaniques a l'Electronique (CAMECA), Courbevoie, France

Filed Dec. 13, 1973, Ser. No. 424,425

Claims priority, application France, Dec. 19, 1972, 72.45248

Int. Cl. G01n *23/20*

U.S. Cl. 250—272 **7 Claims**



1. An X-ray spectrometer comprising: a support plate having first and second end points mounted for translating along first and second fixed translation axes respectively, said translation axes being at an angle to each other; an analyser crystal mounted on said support plate, and having a point coincident with said first end point; a member mounted for translating parallel to said second translation axis, said support plate being rotatably mounted relatively to said member about a first rotation axis passing through said second end point; a main arm rotatably mounted relatively to said support plate about a second rotation axis intersecting said support plate at a further point thereof distinct from the centre of the Rowland circle defined by said two end points and the point of intersection of said two translation axes; a link rotatably mounted, relatively to said arm, about a third rotation axis, the distance between said second and third rotation axes being equal to the radius R of the Rowland circle; an X-ray detector, a predetermined point of which is fixed relatively to said link; further means for causing said link to have a fixed orientation relatively to said support plate; and a mechanical coupling between said arm and said member for causing said arm to rotate relatively to the support plate by an angle double from the rotation angle of the rotation component of the motion of said support plate relatively to said second translation axis.

3,906,226

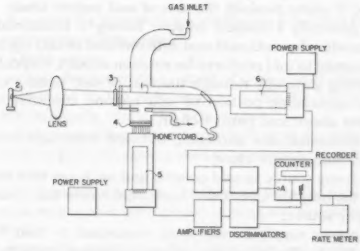
NITRIC OXIDE POLLUTION MONITOR

Hideo Okabe, Rockville, and Frederick P. Schwarz, Mount Airy, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Mar. 29, 1974, Ser. No. 456,342

Int. Cl.[2] G01J *1/42*

U.S. Cl. 250—304 **1 Claim**



1. A fluorescence method for determining relatively small concentrations of NO in a gaseous mixture, such as automotive exhaust gas, which contains relatively large concentrations of NO fluorescence quenching gases such as CO_2 and H_2O, comprising:

irradiating a gas consisting essentially of N_2 with ultraviolet in about the 2,100–2,300 A region and measuring the resultant background signal at about 2,200–3,200 A;

diluting said gaseous mixture with N_2 in a volume ratio of about 1:100;

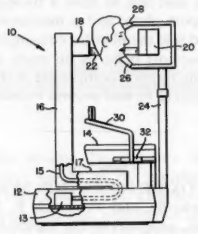
irradiating said N_2-diluted gaseous mixture with ultraviolet in about said 2,100–2,300 A region and measuring the resultant background and NO fluorescence signal at about said 2,200–3,200 A; and

subtracting said background signal from said background and NO fluorescence signal to obtain the desired NO fluorescence signal; said dilution of said gaseous mixture with N_2 serving to reduce fluctuations in said NO fluorescence signal due to fluctuations in the concentrations of said NO fluorescence quenching gases in said gaseous mixture.

3,906,227
DENTAL X-RAY MACHINE

Frieder H. Ensslin, and Paul J. Yarnall, both of Rochester, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,274
Int. Cl.[2] G03B *5/17*
U.S. Cl. 250—320 **18 Claims**



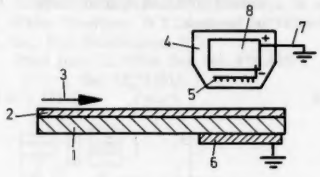
1. Dental X-ray apparatus of the type for taking a full mouth X-ray comprising:
   a. a base adapted to rest on a floor surface;
   b. a patient chair on said base and means for holding the head of the patient at a defined reference point;
   c. platform supported for movement relative to said base in a X–Y plane beneath the seat of said patient chair:
   d. a generally L-shaped column having a horizontal leg extending beneath said seat with one end of said leg being mounted to said platform for rotation about a vertical axis passing generally through the seat of said patient chair, the upstanding portion of said column extending to a point above said patient chair;
   e. a horizontal arm extending outward from said column over said patient chair;
   f. an X-ray source in said column and an X-ray film holder on the outward end of said horizontal arm in line with said X-ray source;
   g. a power supply in said base connected to said X-ray source by flexible cable means extending through said column;
   h. first drive means carried by said platform for rotating said column and therefore said X-ray source and film holder about said vertical axis, whereby said X-ray source and film holder orbit the head of a patient positioned at said reference point; and
   i. second X–Y drive means carried by said platform and cooperating with said base for moving said platform uninterruptedly along a closed curved path of travel in an X–Y plane, which movement when associated with the rotation of said column produces a net orbital movement of said X-ray source and film holder along a path of travel which parallels the dental arch.

3,906,228
X-RAY PHOTOGRAPHIC PROCESS

Gottfried Lange, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 10, 1973, Ser. No. 405,057
Claims priority, application Germany, Oct. 16, 1972, 2250689
Int. Cl. G03g *5/00*
U.S. Cl. 250—315 **1 Claim**

1. A method of imaging with X-rays by exposing to image-carrying X-rays a layer of selenium-arsenic containing 0.01–1 atom percent arsenic, said layer being bonded directly to an

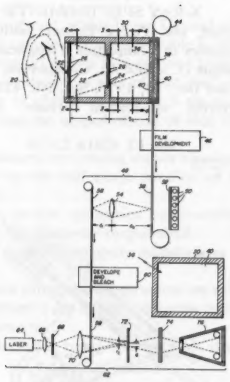


electrically conducting plate and negatively charged in a corona discharge device.

3,906,229
HIGH ENERGY SPATIALLY CODED IMAGE DETECTING SYSTEMS

Gordon D. DeMeester, Marlboro; Harrison H. Barrett, Lexington, and David T. Wilson, Billerica, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 12, 1973, Ser. No. 369,377
Int. Cl. G01t *1/16*
U.S. Cl. 250—336 **11 Claims**

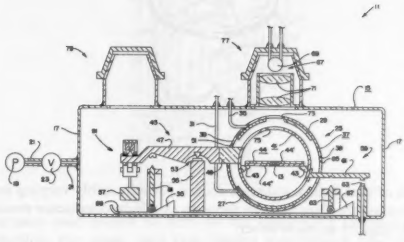


1. The method comprising the steps of:
   introducing radioactive material into an organ of a living body; and
   forming a spatially coded pattern of high energy radiation level particles emitted from said radioactive material by selectively absorbing said high energy particles in a plurality of regions spaced along the average direction of motion of said particles through said regions by means comprising a plurality of zone plates each of which has a zone pattern of selective absorption of said particles which is substantially symmetrical about an axis substantially parallel to said average direction of motion of said particles through said zone plates.

3,906,230
CHARGED PARTICLE DETECTOR

Richard D. Hagen, 105 W. Pawley Rd., Oak Ridge, Tenn. 37830

Filed Apr. 3, 1974, Ser. No. 457,443
Int. Cl. G01t 1/16
U.S. Cl. 250—336 11 Claims



1. Detector means for use with a specimen to detect whether the specimen is emitting charged particles, said detector means comprising:

a. capacitor means including a first capacitor plate for creating a positive Coulombs field and including a second capacitor plate for creating a negative Coulombs field;

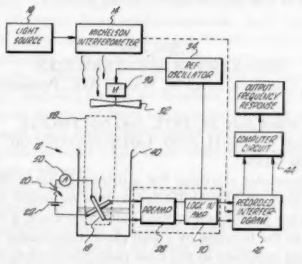
b. accumulator means positioned intermediate said first and second capacitor plates and adjacent the specimen for statically accumulating any charged particles emitted by the specimen so that said accumulator means is attracted to said first capacitor plate if the specimen emits negatively charged particles and is attracted to said second capacitor plate if the specimen emits positively charged particles; and

c. means for pivotally balancing said accumulator means between said first and second capacitor plates when said accumulator means is neither positively or negatively charged.

3,906,231
DOPED JOSEPHSON TUNNELING JUNCTION FOR USE IN A SENSITIVE IR DETECTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Melvin M. Saffren, Altadena, Calif.

Filed Mar. 19, 1974, Ser. No. 452,770
Int. Cl.² H01L 39/22
U.S. Cl. 250—338 29 Claims



1. A superconductive tunneling device capable of supporting Josephson tunneling current therethrough, comprising:

a first superconducting electrode;

a second superconducting electrode;

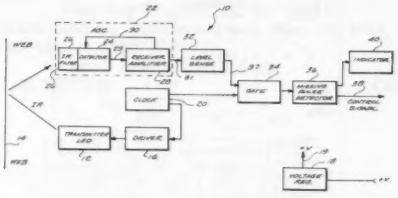
a tunnel barrier sufficiently thin to allow Josephson tunneling current therethrough located between said first and second electrodes; and

means for increasing the sensitivity of said tunneling device to specific ranges of incident radiant energy including a molecular species added to the tunnel barrier and located between said first and second electrodes to form active coupling sites capable of coupling incident radiant energy of a spectrum characteristic of said molecular species into said tunnel barrier.

3,906,232
WEB BREAK DETECTOR

Edward F. Meihofer, Norfolk, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Continuation-in-part of Ser. No. 411,413, Oct. 31, 1973, abandoned. This application June 17, 1974, Ser. No. 479,900
Int. Cl.² G01N 21/30
U.S. Cl. 250—341 13 Claims



1. A system for monitoring a moving web for breaks in the web, said system comprising

A. a light source,

B. a clock for generating a train of pulses, said clock being connected to the light source so that the clock pulses intermittently excite the light source,

C. a light sensor responsive to the light from the light source so as to generate sense pulses in response to light from the source,

C. a light sensor responsive to the light from the light source so as to generate sense pulses in response to light from the source,

D. means for positioning the light source and sensor so that they are aimed at a selected point in the path of a moving web,

E. a monitor circuit responsive to the sense pulses for generating an alarm signal, and

F. a gate in circuit between the sensor and the monitor circuit, said gate being activated by the coincidence of clock pulses and sense pulses so that the monitor circuit generates an alarm signal depending upon the presence or absence of web at the selected point in the web path, said positioning means being arranged to mount the light source and light sensor in a position close to the web path and on opposite sides of a center line perpendicular to the web path each at an angle relative to the center line such that the system is sensitive to a slack web condition at the selected poinnt, but insensitive to a fluttering web at the selected point.

3,906,233
SYSTEM AND METHOD FOR ADMINISTERING RADIATION

Thomas M. Vogel, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 12, 1973, Ser. No. 406,080
Int. Cl. G01t 1/17
U.S. Cl. 250—355 33 Claims

1. A system for metering the quantity of radiation of a

subject by an apparatus including a radiation source, said system comprising:

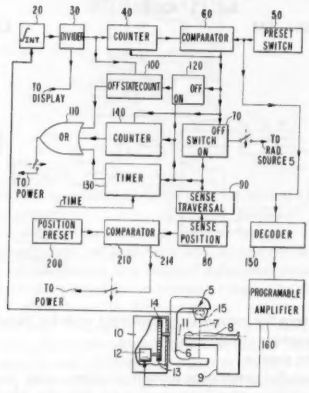
a. means for causing relative movement between the source and the subject along a path;

b. means for sensing the relative movement along traversal of a plurality of increments of the path;

c. means for sensing the amount of radiation from the source toward the subject during the traversal of each of said increments;

d. means connected to said radiation sensing means for cumulatively counting said sensed amount of radiation from the source toward the subject during the traversal of each of said increments and generating a counting signal which is a function of said counted amount of radiation;

e. presetting means generating a radiation limit signal which is a function of a predetermined quantity of radiation to be delivered during each of said increments;



f. comparing means connected to said counting and presetting means for producing a stop signal when the amount of radiation counted by said counting means becomes substantially equal to said predetermined amount;

g. means connected to said comparing means for disabling the source in response to the production of said stop signal;

h. said traversal sensing means producing an enabling signal in response to traversal of said motion across the initial boundary of each of said increments;

i. enabling means responsive to the occurrence of said enabling signal for enabling the source to resume emission of radiation;

whereby the amount of radiation delivered to the subject during the traversal of each of said increments is substantially limited to said predetermined amount.

3,906,234

GAMMA CAMERA

Bernhard Conrad, Erlangen-Bruck, and Karl-Georg Heinzelmann, Uttenreuth, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

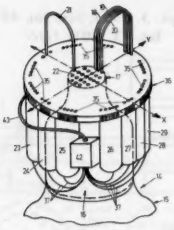
Filed Sept. 24, 1973, Ser. No. 399,713

Claims priority, application Germany, Oct. 5, 1972, 2248731

Int. Cl. G01t *1/202*

U.S. Cl. 250—366 **3 Claims**

1. In a gamma camera for determining the distribution of radioactive materials in a body; comprising a scintillation layer; image intensifying means having an output screen operatively associated with said scintillation layer; photoelectric transducers; light conductor means interconnecting said photoelectric transducers and said output screen; and signal evaluating and indicating means connected to the output side of said transducers, the improvement comprising: individual adjustable shutter means being associated with respectively



each of said light conductor means for adjustably varying and balancing the flow of light through said light conductor means with respect to each other.

3,906,235

DENTAL X-RAY PHOTOGRAPHIC DEVICE

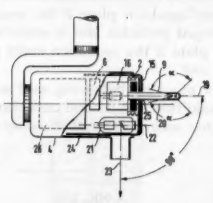
Heimbert Fischer, Feldbergstrasse, D 7801 Vorstetten, Germany

Continuation-in-part of Ser. No. 365,372, May 30, 1973, which is a division of Ser. No. 154,530, June 18, 1971, Pat. No. 3,752,990. This application Sept. 26, 1974, Ser. No. 509,607

Claims priority, application Germany, June 22, 1970, 2030624

Int. Cl. H01j *35/00*

U.S. Cl. 250—404 **10 Claims**



1. A device for use in the production of dental X-ray photographs comprising two separate X-ray systems, one of which comprises a hollow-anode X-ray tube mounted in a housing and including an anode tube projecting from the housing for extra-oral photographs, and the other of which comprises an X-ray tube for intra-oral and extra-oral photographs provided in the housing, said other X-ray tube being mounted to direct its emitted X-rays at an angle of substantially 90° to the longitudinal axis of the hollow-anode X-ray tube.

3,906,236

DRINKING GLASS STERILIZER

Barbara H. Callahan, 6103 W. Walnut Ave., Pennsauken, N.J. 08109

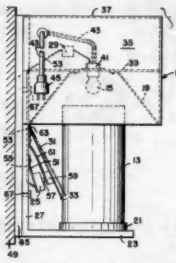
Filed July 28, 1971, Ser. No. 166,822

Int. Cl.[2] **A61L** *3/00*; **G01N** *21/00, 23/00*

U.S. Cl. 250—455 **2 Claims**

1. An ultraviolet sterilizer for a drinking glass, cup, or the like comprising an ultraviolet ray source mounted in a housing, a reflector positioned around said ray source, a base plate connected to the housing by a wall plate, ring means including a seating ring mounted in the base plate for holding the drinking glass in position beneath the ray source so that the ultraviolet rays strike the inside and outside of the glass, an electrical switch mounted on the wall plate and connected in circuit with the ultraviolet ray source, an actuating plate hingedly mounted on the wall plate, and a spring mounted on the wall plate and pushing against said actuating plate to normally

position the bottom edge of the actuating plate over the seating ring when the glass is not seated in the ring, so that, in setting the drinking glass into the ring, the drinking glass pushes the actuating plate against the force of said spring to



actuate said switch to turn on the ultraviolet ray source to sterilize the glass, said ring means maintaining said switch closed by holding the drinking glass in position against said actuating plate and against the force of said spring to maintain the ultraviolet ray source in activated condition.

3,906,237

ION GAUGES

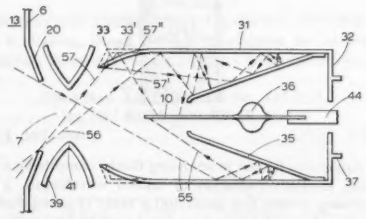
Lawrence Graham Pittaway, Salfords, Near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 25, 1973, Ser. No. 363,823

Claims priority, application United Kingdom, May 26, 1972, 25017/72

Int. Cl. H01j *3/108*

U.S. Cl. 250—489 **8 Claims**



1. An ion gauge having a low x-ray photo-electron current, comprising:

a source of electrons;

a conductive electron accelerating grid cage adjacent said source which cage may be suitably biased so as to accelerate electrons from said source into said cage to collide with and ionize gas molecules therein, said cage having a conductive wall substantially opaque to any x-rays generated by collision of said accelerated electrons with said cage, said wall having an aperture through which gas ions may be extracted from the interior of said cage, the mesh of said cage being sufficiently small so as to shield the interior of said cage from electron accelerating fields exterior thereto;

an annular extractor electrode exterior to said cage and adjacent and surrounding said aperture but insulated therefrom, which extractor electrode may be suitably biased to draw gas ions from said cage;

a thin rod-like collector electrode mounted external to said cage with the axis thereof directed toward said aperture, which collector electrode may be suitably biased to collect gas ions drawn from said cage by said extractor electrode; and

a hollow deflector electrode positioned adjacent to but insulated from said extractor electrode for receiving gas ions drawn from said cage by said extractor electrode, said deflector electrode surrounding said collector electrode so as to deflect gas ions toward said collector electrode upon suitable biasing of said deflector electrode, said deflector electrode having at least two interior surfaces which converge away from said aperture to form a relection trap for soft x-rays, the interior surfaces of said deflector electrode being so angled that most soft x-rays coming from said cage through said aperture and striking said deflector electrode suffer multiple reflections in said reflection trap before striking said collector electrode, thereby substantially reducing the intensity of soft x-rays striking said collector electrode and the photo-electron current generated thereby.

3,906,238

SIZE CONTROL DEVICE FOR CONTINUOUSLY PRODUCED ELONGATE OBJECT

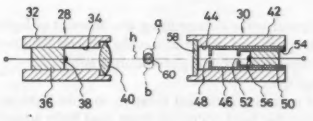
Eigo Yagi, 27-12,3-chome, Wakabaya, Setagawa, and Keiichi Shiraishi, 44-8,5-chome, Kameido, Kotoh, both of Tokyo, Japan

Filed May 28, 1974, Ser. No. 474,110

Claims priority, application Japan, May 30, 1973, 48-59742; May 30, 1973, 48-59743

Int. Cl.² G01N *21/30*

U.S. Cl. 250—548 **7 Claims**



1. A size control device for an extrusion molding machine in which an extruded material is drawn by draw-off means, comprising an opto-electric scanning means for optically scanning the extruded material and producing an electrical signal representative of a cross-sectional size of the scanned extruded material, a first comparator circuit for comparing the signal from the scanning means with a first reference signal representative of a predetermined cross-sectional size of the extruded material for producing an output signal representative of an amount of deviation of the detected cross-sectional size of the scanned extruded material from the predetermined cross-sectional size, a second comparator circuit for comparing the output signal of the first comparator circuit with a reference signal representative of a prescribed allowable range of deviation of the detected cross-sectional size of the extruded material from the predetermined cross-sectional size for passing therethrough the output signal of the first comparator circuit when the detected cross-sectional size of the scanned extruded material falls outside the prescribed allowable range, a control signal generating circuit responsive to the output signal passed from the second comparator circuit for providing a control signal having a duration which is representative of the amount of deviation of the detected cross-sectional size of the scanned extruded material, drive means triggered by said control signal for driving said draw-off means to change the rate of drawing the extruded material for an interval which corresponds to the duration of the control signal, and a timing circuit connected to an output terminal of said control signal generating circuit for producing an output signal having a predetermined duration in response to the control signal delivered from the control signal generating circuit, and a holding circuit having an input terminal connected to an output terminal of the timing circuit and an output terminal connected to said second comparator circuit for holding the second comparator circuit in a locked condition for a time interval which is equal to the duration of the output signal from the timing circuit so that the delivery of the output signal from the second comparator circuit to said

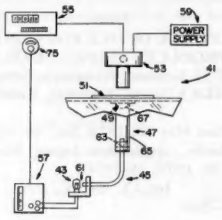
control signal generating circuit is interrupted for said time interval.

3,906,239

LIGHT MEASURING APPARATUS FOR APERTURED MATERIAL

Charles W. Smith, Ulster, and Mahlon D. Dyer, Sugar Run, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 8, 1974, Ser. No. 467,940
Int. Cl.² G01N *21/32*
U.S. Cl. 250—562 **9 Claims**



1. An apparatus for determining the amount of light passing through an apertured material having several relatively small apertures therein, said apparatus comprising:

a light source;

diffusion means positioned relative to said light source for diffusing the light received from said light source;

collimation means positioned relative to said diffusion means for collimating the diffused light from said diffusion means to provide a substantially parallel beam of diffused light;

focusing means positioned relative to said collimation means and on one side of said apertured material for receiving said substantially parallel beam of diffused light from said collimation means and providing a focused beam of light through said apertured material;

receiving means positioned on an opposing side of said aperture material from said focusing means for receiving said focused beam of light passing through said apertured material from said focusing means; and

measuring means operatively connected to said receiving means for measuring the amount of focused light received by said receiving means.

3,906,240

FOLDING PHOTO-ELECTRIC DETECTING DEVICE

Samuel J. Jeffree, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sept. 27, 1974, Ser. No. 510,008
Int. Cl.² G01N *21/30*; H01J *5/02*
U.S. Cl. 250—571 **18 Claims**

1. An emitter-detector unit for sensing the movement of documents along a guide channel having a pair of apertured sidewalls comprising:

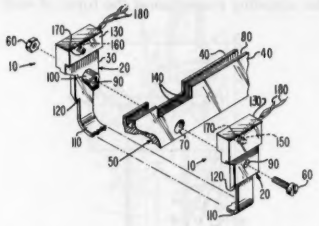
a. a pair of interconnected blanks opposively abutting the outside surfaces of the apertured sidewalls,

b. a pair of lips protruding from said blanks and into corresponding ones of the sidewall apertures for aligning said blanks in relation to one another,

c. means for emitting secured to one of said pair of blanks and snugly positioned relative to the aperture of its associated sidewall,

d. means for sensing secured to the other of said blanks and snugly positioned relative to the aperture of its associated sidewall so as to be aligned with said emitting means, and

e. means for fastening said blanks to the apertured sidewalls whereby the movement of documents along said



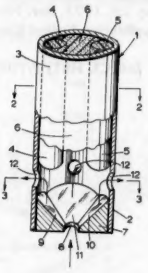
guide channel is detected by said emitting means and said sensing means.

3,906,241

APPARATUS FOR USE IN ANALYSING FLUIDS

John Michael Thompson, 22 Greenside, Harborne, Birmingham, England (B17, OBT)

Filed May 23, 1974, Ser. No. 472,878
Claims priority, application United Kingdom, May 23, 1973, 24613/73
Int. Cl.² G01N *21/26*
U.S. Cl. 250—5′ **9 Claims**



1. Apparatus for use in analysing fluids, comprising a source of high intensity radiation of known wavelength, a probe comprising a detecting head and a body of elongated shape extending from the detecting head and incorporating three fibre optics channels extending lengthwise of the body, the first of said channels being so positioned as to receive radiation from said source and to transmit it to a gap at the detecting head which can contain a fluid to be analysed, the radiation being directed across the gap to the second of said channels which is so positioned as to return the radiation from the head, receiving means being provided for receiving and dissipating the energy of the radiation from the second channel, and the third of said channels leading from the head and being positioned to receive Raman radiation scattered by that fluid in the gap, and detector means operative to receive that radiation from said third channel.

3,906,242

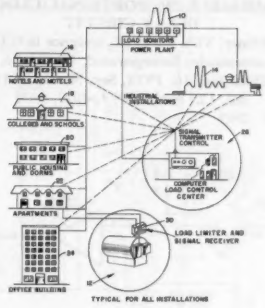
COMPUTERIZED PEAK-SHAVING SYSTEM FOR ALLEVIATING ELECTRIC UTILITY PEAK LOADS

Robert H. Stevenson, Barrington, R.I., assignor to Megatherm Corporation, East Providence, R.I.

Filed Aug. 16, 1974, Ser. No. 497,967
Int. Cl. H02j *13/00*
U.S. Cl. 307—38 **19 Claims**

1. A method of lowering peak electrical energy demand on a central electrical distribution network to alleviate a power emergency while minimizing the impact of service disruption, comprising the steps of sensing the approach of an excessive

demand peak, in response thereto remotely disconnecting simultaneously a plurality of similar interruptible loads powered via said network, said loads being divided into a plurality of mutually exclusive groups based on similar reserve-capacity-versus-time characteristics, indicating time-varying permissible off-times for corresponding ones of said groups based on



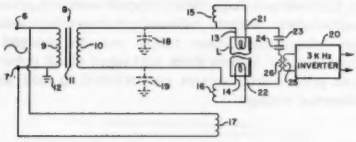
characteristic projected energy consumption profiles predicted from past statistical records for said groups, and remotely reconnecting said loads automatically, one-group-at-a-time, in accordance with said permissible off-times, whereby said loads are reconnected on a changing priority basis projected by customer needs.

3,906,243

RETROFIT EMERGENCY LIGHTING SYSTEM

Rollie R. Herzog, Burnt Hills, N.Y., assignor to Construction Materials Division, General Electric Company, Indianapolis, Ind.

Filed Nov. 14, 1973, Ser. No. 415,653
Int. Cl.[2] H02J *9/00;* **H05B** *41/14*
U.S. Cl. 307—66 **1 Claim**



1. A ballast apparatus for operating at least one gaseous discharge lamp during normal and emergency modes comprising:

a ballasting isolation transformer having a main primary winding and a secondary winding, one side of said main primary winding being connected to ground;

a pair of input terminals connected across said main primary winding for connection to a source of AC power;

a pair of filament windings wound in pancake form and arranged for connection to the at least one gaseous discharge lamp;

said secondary winding connected to said filament windings;

a second primary winding connected across said main primary winding, said second primary winding being magnetically coupled to said filament windings, said filament windings and said second primary winding being mounted laterally with respect to each other for providing a substantially low capacitance between said filament winding and said second primary winding;

a first electrical insulation means connected between said second primary winding and at least one of said filament windings;

an inverter circuit connected to said secondary winding for providing operating power during the emergency mode; said inverter frequency being in the range of 2.5 KHz and 4.0 KHz for minimizing capacitive leakage current and inductive shunt current; said inverter circuit connected to a DC power source;

a case housing at least said inverter circuit, said main primary and secondary windings, said second primary winding, and said pair of filament windings;

a second electrical insulation means lining at least a part of said case;

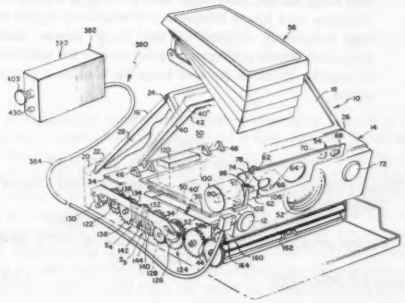
a plurality of leads extending from said ballast case, said leads being of minimum length to make their connections so as to provide a substantially low stray capacitance.

3,906,244

REMOTE CONTROL SYSTEM FOR PHOTOGRAPHIC APPARATUS

Edison R. Brandt, Boca Raton, Fla., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 246,906, April 24, 1972, Pat. No. 3,818,499. This application Jan. 4, 1974, Ser. No. 430,698
Int. Cl.[2] H01H *19/00*
U.S. Cl. 307—115 **10 Claims**



1. A remote actuator for use with a photographic camera of the type having first electrical switch means for initiating a photographic cycle in parallel connection with first plural electrical contacts, including:

conductive cable means together with connecting means adapted for establishing an electrically conductive connection with said first plural electrical contacts;

second switch means for selectively establishing an electrically conductive parallel connection across said first plural electrical contacts by way of said cable means; and means for delaying the opening of said electrically conductive parallel connection across said first plural electrical contacts by said second switch means for a predetermined interval.

3,906,245

GRADED JUNCTION VARACTOR FREQUENCY DIVIDER CIRCUITS EMPLOYING LARGE DIVISION FACTORS

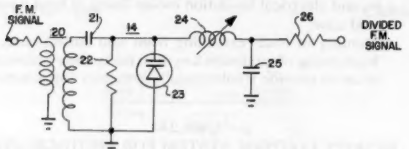
Michael T. Shen, 8 Place Dargent, Eich, Luxemburg

Division of Ser. No. 325,673, Jan. 22, 1973, Pat. No. 3,855,615. This application Dec. 26, 1973, Ser. No. 427,719
Int. Cl.[2] H03K *23/14, 21/00*
U.S. Cl. 307—225 R **8 Claims**

1. A frequency divider circuit for dividing an input signal of a given frequency by a large factor comprising:

a. a varactor diode having a first and second terminal and a graded junction therebetween, characterized by a first

region of a heavily doped semiconductor material of a given conductivity conductor contiguous with a second region of a lighter doped semiconductor material of opposite conductivity defining a central region contiguous at one end with a third region of a semiconductor material of same conductivity as said central region and an impurity doping level approaching that of said first region, said varactor diode exhibiting a capacitance variation inversely proportional to an integral root of a voltage applied across said first and second terminals,



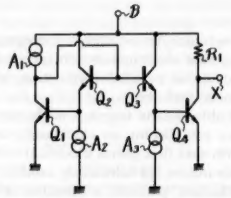
b. means coupled across said first and second terminals, including a tuned circuit for applying a relatively high frequency signal thereto, and

c. means coupled to said varactor and resonant at a lower frequency to provide across said means a frequency related to said high frequency but different therefrom by said large factor, said large factor being in excess of 100, whereby said lower frequency is relatively equal to said high frequency divided by said large factor, said high frequency signal acting as a pump source for said varactor to enable divisions by said large factors in a parametric mode.

3,906,246
TRANSISTOR CONTROL CIRCUIT

Takashi Okada, Yamato, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 18, 1974, Ser. No. 480,367
Claims priority, application Japan, June 20, 1973, 48-69549
Int. Cl.[2] G06G *7/16*
U.S. Cl. 307—229 **13 Claims**



1. A transistor control circuit comprising:

first transitor means;

second transistor means having an emitter electrode connected to the base electrode of said first transistor means;

third transistor means having a base electrode connected to the base electrode of said second transistor means;

fourth transistor means having a base electrode connected to the emitter electrode of said third transistor means;

a first current source for supplying a first current to flow through said first transistor means;

a second current source connected to said emitter electrode of said second transistor means for supplying a second current;

a third current source connected to said emitter electrode of said third transistor means for supplying a third current;

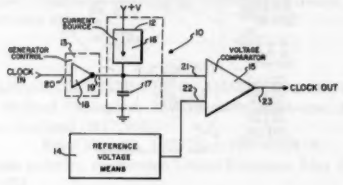
means for connecting said base electrodes of said second and third transistor means to the collector electrode of said first transistor means; and

means for deriving an output signal from the collector electrode of said fourth transistor means, said output signal being a function of said first, second and third currents.

3,906,247
PROGRAMMABLE PROPORTIONAL CLOCK EDGE DELAY CIRCUIT

Samuel T. Heffner, Villa Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 16, 1974, Ser. No. 433,641
Int. Cl.[2] H03K *5/13, 4/08, 5/04*
U.S. Cl. 307—293 **9 Claims**



1. In combination, a clock edge delay circuit for delaying the clock edges of input clock pulses supplied by a clock pulse source comprising:

a ramp generator including a constant current source for generating linear ramp voltages;

ramp generator control means responsive to successive clock pulse edges for alternately initiating and terminating said ramp voltage generation;

reference voltage means including a digital-to-analog converter for providing any selected one of a plurality of discrete reference voltages; and

a voltage comparator having a first input, a second input and an output, said first input being coupled to said ramp voltage generator, said second input being coupled to said reference voltage means and providing delayed clock pulse edges at said output responsive to voltage comparisons on said input; whereby,

when said ramp voltage bears a predetermined relation to said selected discrete reference voltage, said circuit at said voltage comparator output provides delayed clock edges delayed in time from said input clock pulse edges by a preselected amount proportional to said selected reference voltage.

3,906,248
TIME DELAY CIRCUIT EMPLOYING FIELD EFFECT TRANSISTOR AND DIFFERENTIAL OPERATIONAL AMPLIFIER

Joseph G. Vieira, Plainville, and Leo A. Plouffe, North Dighton, both of Mass., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed Nov. 29, 1971, Ser. No. 202,765
Int. Cl.[2] H03K *5/13;* **H01H** *47/18;* **G01R** *29/02*
U.S. Cl. 307—293 **18 Claims**

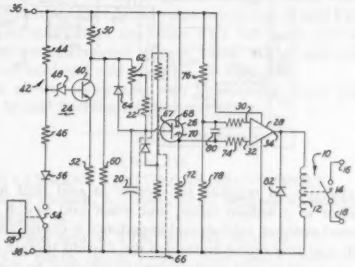
1. In an electrical control system for controlling the state of energization of a load responsive to an input control signal, a timing circuit for providing a predetermined time delay between initiation of the control signal and a change in the state of energization of the load, said timing circuit comprising

a time delay network including an interconnected resistor and capacitor,

selectively energizable input switch means connected to said time delay network for effecting charging and discharging of said capacitor in predetermined time intervals responsive to the initiation of the control signal,

a voltage sensing switch control means connected to said capacitor for sensing the voltage thereacross and producing an energizing signal systematically related to said voltage,

comparison means including first and second input terminals and an output terminal, means for providing said first input terminal with a bias signal having a preselected voltage level relative to the voltage level at said second input terminal for maintaining said comparison means in



a de-energized state and said second input terminal being connected to said voltage sensing switch control means for receiving said energizing signal, said comparison means being energized only when said energizing signal is of a predetermined magnitude relative to said bias signal so as to provide an output signal responsive to energization thereof, and

selectively operable output switch means connected to said output terminal for controlling the state of energization of the load.

3,906,249

MOUNTING DEVICE FOR OSCILLATORY CRYSTAL WHICH CONVERTS TORSIONAL VIBRATIONS TO FLEXURAL VIBRATIONS

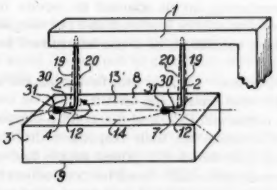
Guy Gibert, and Pierre Vidal, both of 101, rue du President Roosevelt, 78-Sartrouville, France

Continuation-in-part of Ser. No. 223,604, Feb. 4, 1972. This application May 18, 1973, Ser. No. 361,513

Claims priority, application France, Feb. 26, 1971, 71.06695

Int. Cl. H01 *41/04*

U.S. Cl. 310—9.1 **6 Claims**



1. In a fixing device for an oscillatory crystal bar of parallelepiped form capable of mechanical oscillations in a flexion mode in a plane parallel to that of the fixing faces of said parallelepiped, mounting means for converting torsional vibrations to flexional vibrations, said device comprising a fixed support, and a plurality of suspension wires each being attached at one end thereof to said support, and at the other end thereof being formed into a lever aligned parallel to sid flexion plane, the extremity of said lever portion of each of said wires being fixed on its lateral surface to the fixing faces at points of minimum vibration wherein the portion of each of said suspension wires between said one end and said other end having a length equal to a quarter of the wavelength of propagation of flexional oscillations in said suspension wires, the frequency of said flexion oscillations being equal to the frequency of said mechanical oscillations of said crystal bar.

3,906,250

METHOD AND APPARATUS FOR GENERATING POWER UTILIZING PRESSURE-RETARDED-OSMOSIS

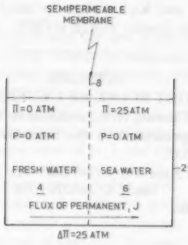
Sidney Loeb, Beersheba, Israel, assignor to Ben-Gurion University of the Negev Research & Development Authority, Beersheba, Israel

Filed June 19, 1974, Ser. No. 480,623

Claims priority, application Israel, July 3, 1974, 42658; May 10, 1974, 44799

Int. Cl.² F03G *7/06*

U.S. Cl. 290—1 **31 Claims**



1. A method of generating power comprising: applying a hydraulic pressure to a first liquid of a first osmotic pressure and introducing same into a first pathway which is at least partially defined by one face of a semipermeable membrane; introducing a second liquid having a lower hydraulic pressure and a lower osmotic pressure into a second pathway which is at least partially defined by the opposite face of the membrane; maintaining the hydraulic pressure difference between liquids on the opposite faces of the membrane at a pressure difference which is less than the osmotic pressure difference between the liquids, at every point in the two pathways, thus effecting by Pressure-Retarded-Osmosis a passage of at least part of the second liquid through the semipermeable membrane, forming a pressurized mixed solution of greater volume than said first liquid introduced into said first pathway; and converting the potential energy stored in the pressurized mixed solution to useful energy.

3,906,251

PLURALITY OF SELECTIVE SOURCES FOR CONVERTER SYSTEM

Kikuo Tanida, Tokyo; Kenro Teraoka, Chofu, and Yuji Inomata, Kawasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 7, 1974, Ser. No. 477,353

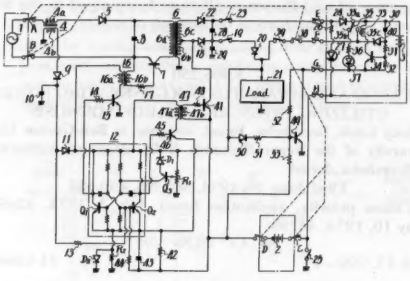
Claims priority, application Japan, June 9, 1973, 48-68416

Int. Cl.² H02J *1/00*; **H02M** *3/00*

U.S. Cl. 307—45 **3 Claims**

1. An electric source circuit comprising a first direct current source, a second direct current source, an electric source switch common to both said first and second current sources, a load, a DC-DC converter inclusive of a pulse oscillator and for converting the voltage from said second direct current source into a given voltage and supplying said given voltage to said load, a kick circuit for said DC-DC converter and an overdischarge indicator circuit provided for said first direct current source whereby the voltage from said first direct current source is directly supplied to said load and the voltages from said first and second direct current sources are selectively supplied to said load, said electric source circuit

comprising a switch for opening a closed circuit consisting of said first and second direct current sources, overdischarge



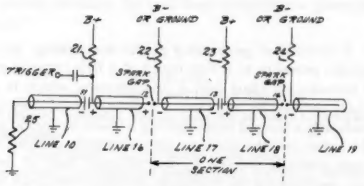
indicator circuit and kick circuit for said DC-DC converter when said electric source switch is OFF.

3,906,252

SHORT PULSE RF GENERATOR

Paul Van Etten, Clinton, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 19, 1974, Ser. No. 480,770
Int. Cl.² H03K *3/00*
U.S. Cl. 307—106 **5 Claims**



1. A high peak power short pulse RF generator comprised of a multiplicity of sections of transmission lines of preselected length, said multiplicity of sections being connected in a series arrangement having a first section at one end and a last section and the other end; each of said sections being comprised of in series connection and in the recited sequence, a first transmission line, a coupling capacitor, a second transmission line, and a spark gap; a load connected to the first section of said series arrangement; a third transmission line connected to the last section of said series arrangement; and means to charge each of said sections to a predetermined magnitude to sequentially fire said spark gaps in said sections with said spark gap in said first section firing first.

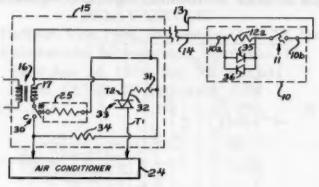
3,906,253

POWER-REGULATED THERMOSTAT CONTROL SYSTEM FOR HEATING/COOLING USE

Ray Scott Farley, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Continuation of Ser. No. 416,389, Nov. 16, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 501,883
Int. Cl.² F25B *29/00*
U.S. Cl. 307—117 **4 Claims**

1. A thermostatic control system for selectively operating either a heat controlling means or an air conditioning means comprising: a source of power; a heat/cool switch having first and second positions; a thermostat connected between said source and said switch and including a bimetal switch, a heat anticipator resistor connected in series with said bimetal switch and voltage regulating means including at least one rectifier diode connected in parallel with said heat anticipator resistor; first and second conductive wires connected between said thermostat and said source and said switch respectively; function inverter means connected in circuit with said source and said thermostat when said switch is in said second position for operating said air conditioner when said bimetal switch is open; and second resistive means having an impedance greater than that of said heat controlling means, whereby when said switch is in said first position, said regulating means



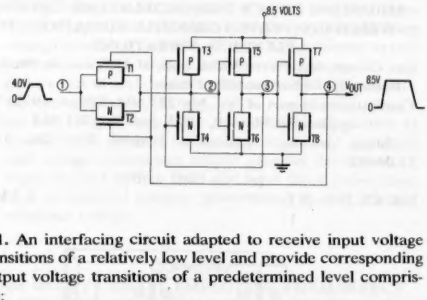
is effective to regulate the power to said heat anticipator resistor to a known value, and when said switch is in said second position, said second impedance is connected in series with said thermostat to reduce the current therein below the level at which said diode means is effective to regulate, the power dissipated in said anticipator resistor being proportional to the operating cycle of said unit both in said heating and said cooling means.

3,906,254

COMPLEMENTARY FET PULSE LEVEL CONVERTER

Ralph D. Lane, Wappingers Falls, and Richard A. Manning, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,946
Int. Cl.² H03K *19/08, 3/353, 17/60*
U.S. Cl. 307—205 **6 Claims**



1. An interfacing circuit adapted to receive input voltage transitions of a relatively low level and provide corresponding output voltage transitions of a predetermined level comprising:

a. an output node for said interfacing circuit and an input node for said interfacing circuit,

b. a first n-channel FET and a second p-channel FET connected in series via their respective drain-source leads between a terminal of a power supply and a terminal at a reference potential, the series connection between said first and second FET's being connected to said output node,

c. latching circuit means having input and output nodes and being connected between said power supply and reference potentials, said latching means comprises;

i. inverter means responsive to a variation in voltage at said latching circuit input node in a first and second direction to cause a variation in voltage at said latching circuit output node in a second and first direction, respectively, and

ii. voltage variation increasing means responsive to the voltage connected at said latching circuit output node for increasing the variation of voltage at said latching

circuit input node in the direction of initial variation at said latching circuit input node, whereby the further variation of the voltage at said latching circuit input node hard drives said inverter means to cause the voltage at said latching circuit output node to rapidly reach first or second predetermined final voltage values depending on the direction of variation of voltage at said latching circuit input and output nodes,

d. means connecting said output node of said latching circuit means to the gate leads of said first and second FET's, whereby the latching means output node voltage of said first predetermined value drives one of said FET's on hard and drives the other FET off hard, and said second predetermined voltage value drives said other FET on hard and said one FET off hard, and

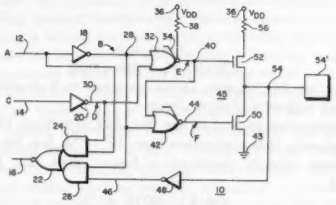
e. input means connecting said interfacing circuit input node to said latching circuit input node.

3,906,255

MOS CURRENT LIMITING OUTPUT CIRCUIT

William David Mensch, Jr., Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 6, 1974, Ser. No. 503,576
Int. Cl.[2] H03K *19/08, 19/22, 19/36;* **H01L** *29/04*
U.S. Cl. 307—205 **3 Claims**



1. An MOS circuit comprising:

a pull-up MOSFET connected between a first node and an output node and having its gate connected to a second node;

a current limiting resistor connected between said first node and a third node for limiting the current in said pull-up MOSFET;

a pull-down MOSFET connected between said output node and a fourth node and having its gate connected to a fifth node;

a first NOR gate having an output connected to said second node and having one input connected to a sixth node and another input connected to a seventh node;

a second NOR gate having an output connected to said fifth node and an input connected to said second node and another input connected to said sixth node;

a first inverter having an output connected to said sixth node and an input connected to an eighth node connected to a first input of said MOS circuit;

a second inverter having an output connected to said seventh node and an input connected to a ninth node connected to a second input of said MOS circuit;

a third inverter having an input connected to said output node and an output connected to a tenth node;

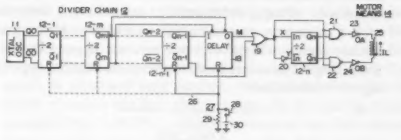
a combinational AND/NOR gate having first and second twoinput AND sections, said combinational AND/NOR gate having an output connected to an eleventh node, said first two-input AND section having an input connected to said seventh node and another input connected to an eighth node, said second two-input AND section having an input connected to said sixth node and another input connected to said tenth node.

3,906,256

DRIVE PULSE GENERATOR FOR USE IN ELECTRONIC ANALOG DISPLAY CLOCK APPARATUS

Yasoji Suzuki, Ayase, and Hisaharu Ogawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 14, 1974, Ser. No. 523,724
Claims priority, application Japan, Mar. 9, 1974, 49-27546
Int. Cl.[2] G04C *3/00*
U.S. Cl. 307—225 R **3 Claims**



1. A drive pulse generator for use in an electronic analog display clock apparatus which is adapted to supply drive pulses to the drive coil of motor means for driving time indication hands, comprising:

a standard frequency signal source;

a frequency divider chain having binary counters cascade-connected in a number of $n-1$ and connected to receive the output of said signal source for frequency-dividing said standard frequency signal in turn;

a delay circuit connected to receive the output of the $n-1$ th stage binary counter of said frequency divider chain for delaying the output of said $n-1$ th stage binary counter in response to the output of one binary counter in said divider chain which produces a higher frequency signal than the output frequency of said $n-1$ th stage binary counter;

logic gate means connected to receive the output of said delay circuit and an output of said $n-1$ th stage binary counter for producing an output pulse signal having a predetermined period and pulse width;

a binary counter (nth stage) connected to receive the output of said logic gate;

logic circuit means connected to receive output of said nth binary counter and output of said logic gate for producing in said drive coil drive pulses passing therethrough at an interval of the predetermined period in mutually opposite directions; and

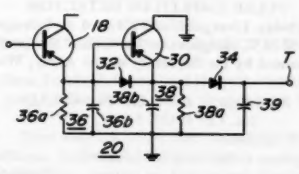
resetting means for supplying a reset signal to at least said $n-1$ stage binary counter and said delay circuit.

3,906,257

NOISE IMMUNITY CIRCUIT FOR USE WITH REMOTE CONTROL RECEIVER

Thomas W. Ivas, Evergreen Park, Ill., assignor to Quasar Electronics Corporation, FRanklin Park, Ill.

Filed Dec. 17, 1973, Ser. No. 425,355
Int. Cl. H03k *17/00*
U.S. Cl. 307—231 **5 Claims**



1. A noise immunization circuit for use with a detector

responsive to input signals for initiating a control effect, comprising in combination:

first integrator circuit means coupled with the detector for developing a first direct current control voltage in response to signals received by said detector;

impedance means;

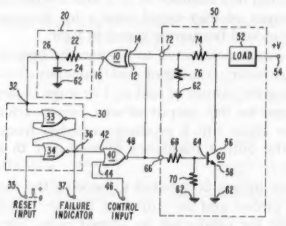
second integration circuit means having a time constant which is long relative to the time constant of said first integration circuit means coupled with said first integration circuit means through said impedance means;

discharge circuit means coupled across said impedance means and rendered conductive in response to a predetermined voltage relationship across said impedance means to remove stored energy in said second integration circuit means whenever interruptions appear in the detected signal as occur in short duration impulse type noise signal information.

3,906,258
FAILURE DETECTING AND INHIBITING CIRCUIT

Douglas Ashworth Moe, Martinsville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,935
Int. Cl.² H03D *13/00*; **H03K** *5/20, 19/20*
U.S. Cl. 307—232 **6 Claims**



1. In combination:

first means responsive to a first circuit input signal and a priming signal for producing a circuit output signal in accordance with the first circuit input signal when the priming signal is present, the circuit output signal being of a fixed value otherwise;

second means responsive to a second circuit input signal and a further signal for producing an output signal in accordance with the exclusive logical sum thereof;

third means responsive to a selected value of the output signal of the second means of greater than a given duration for producing a trigger signal;

bistable means, initially in a first logic state for producing the priming signal and responsive to the trigger signal for switching to its second logic state for terminating the priming signal; and wherein

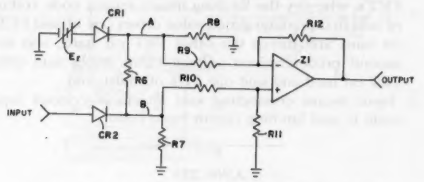
said further signal is a selected one of the first circuit input and the circuit output signals.

3,906,259
PULSE AMPLITUDE DETECTOR

John F. Nicholas, Liverpool, and Edward A. Salvagni, Camillus, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 5, 1974, Ser. No. 439,820
Int. Cl.² H03K *5/153, 5/20*
U.S. Cl. 307—235 R **3 Claims**

1. The system comprising an operational amplifier having first and second inputs and an output; a reference voltage means; first means connecting the reference voltage means to said first input of said amplifier; an input signal; second means connecting said input signal to the second input of said amplifier; first and second diodes being connected respectively between said reference voltage means and said first means, and said input signal and said second means; a first resistor having a first side connected between the first diode and said first means and a second side connected between the second diode and said second means so that said input signal will have

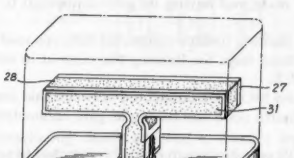


no effect on the operation of the amplifier until it exceeds a predetermined value; a second resistor connected between the output of said amplifier and said first input of said amplifier; said second means being a third resistor; said first means being a fourth resistor; and said third and fourth resistors being equal in resistance to each other.

3,906,260
CRYSTAL VIBRATOR

Kikuo Oguchi, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 289,519, Sept. 15, 1972, abandoned. This application Mar. 29, 1974, Ser. No. 456,334
Claims priority, application Japan, Sept. 22, 1971, 46-74021
Int. Cl.² H01L *41/04*
U.S. Cl. 310—9.6 **3 Claims**



1. A mounted vibrator for use in a timepiece comprising a crystal having a torsional vibrational mode, a pair of discrete electrode tracks deposited thereon, a continuous runner defining said discrete electrode tracks, a sole conductive support member for supporting said crystal and for conductively mounting said crystal, said conductive support being connected to said crystal and said crystal and said conductive support being of substantially identical material, a terminal tag, said conductive support being mounted thereon, and a pair of contact pins mounted in said terminal tag, said conductive support being mounted on said terminal tag between said contact pins, said contact pins being fixedly connected to said conductive support.

3,906,261

LINEAR ACCELERATION APPARATUS WITH COOLING SYSTEM

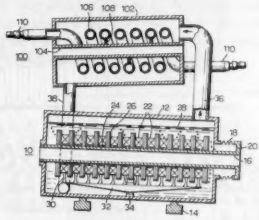
Shinzou Ogura; Masatami Iwamoto; Mitsuru Fukushima; Kazuharu Oshio; Tadashi Majima; Toshiyuki Kaneda, and Hideo Nishii, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Amagasaki, Japan

Filed June 10, 1974, Ser. No. 478,161

Claims priority, application Japan, June 12, 1973, 48-66194; June 14, 1973, 48-67150; Dec. 3, 1973, 48-135889; Feb. 18, 1974, 49-19206

Int. Cl.[2] H02K *41/02*

U.S. Cl. 310—12 **9 Claims**



1. A linear electric-motor type acceleration apparatus having a cooling system, comprising a tubular member, a stator winding means wound around a tubular member and capable of being electrically excited to establish a moving magnetic field to accelerate a body within the tubular member, a coolant container means, a body of liquid cooling medium capable of boiling to form a vapor accommodated in said coolant container means, said stator winding means and said tubular member being immersed in said cooling medium with said tubular member extending through said coolant container means, said stator winding means including a plurality of juxtaposed coil sections each of said coil sections including at least a radial passageway extending out of the coil section from the innermost portion thereof and filled with said cooling medium, said stator winding means in its electrically excited state generating heat to cause said cooling medium to boil and form vapor, and condenser means disposed above said coolant container means, and in fluid communication with said coolant container means for directing said vapor rising spontaneously from said coolant medium into and through said condenser means to be liquidized and for directing the liquidized medium to fall into said coolant container means by its own weight.

3,906,262

TWO-AXIS MAGNETIC POSITIONING DEVICE

Hiromichi Shichida; Kenichi Toyoda, and Seiji Irie, all of Hino, Japan, assignors to Fujitsu Ltd., Kanagawa and Fujitsu Fanuc Limited, Tokyo, both of, Japan

Filed July 22, 1974, Ser. No. 490,661

Claims priority, application Japan, July 31, 1973, 48-89980[U]

Int. Cl. H02k *41/02*

U.S. Cl. 310—12 **5 Claims**

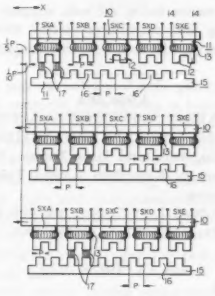
1. A two-axis magnetic positioning device comprised of pulse operated linear motors including:

a first member having a first surface;

a second member of which the bottom forms a second surface and the top forms a third surface, which can move in a first direction with respect to the first member keeping a small air gap between said first surface and said second surface;

a third member having a fourth surface, which can move in a second direction which crosses the first direction with respect to the second member keeping a small air gap between said third surface and said fourth surface; wherein

one of the first and second surfaces being provided with a plurality of first teeth made of a magnetic material which are arranged in the first direction with a constant pitch "P," and each first tooth extends in a direction which is not parallel to the first direction; the other first surface or second surface comprises N number of first electromagnetic energizing means which drive the second member in the first direction with respect to the first member by electromagnetically cooperating with said first teeth wherein each first electromagnetic energizing means has a plurality of pairs of first driving teeth which are surrounded by exciting coils and are arranged in the first direction with the constant pitch "P" and each of the first driving teeth extends in the direction in which each first tooth is arranged and further, each of the first driving teeth of one of the first electromagnetic energizing means is shifted by (1/N)P in relation to each of the first driving teeth of the adjacent members of the first electromagnetic energizing means,



one of the third and fourth surfaces being provided with a plurality of second teeth made of a magnetic material which are arranged in the second direction with a constant pitch "P'," and each second tooth extends in a direction which is not parallel to the second direction; the other of the third surface or the fourth surface comprises N' number of second electromagnetic energizing means which drive the third member in the second direction with respect to the second member by electromagnetically cooperating with said second teeth wherein each second electromagnetic energizing means has a plurality of pairs of second driving teeth which are surrounded by exciting coils and are arranged in the second direction with the constant pitch "P'" and each of the second driving teeth extends in the direction in which each second tooth is arranged and further, each of the second driving teeth of one of the second electromagnetic energizing means is shifted by (1/N')P' in relation to each of the second driving teeth of the adjacent members of the second electromagnetic energizing means.

3,906,263

VIBRATOR MOTOR IN HAND-HELD ELECTRIC APPLIANCE

Evan N. Chen, Fairfield, Conn., and Hugh B. Matthews, Acton, Mass., assignors to Sperry Rand Corporation, Bridgeport, Conn.

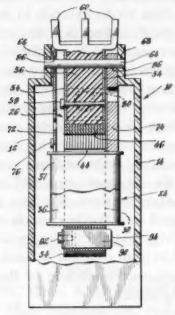
Filed May 23, 1974, Ser. No. 472,539

Int. Cl.[2] H02K *33/00*

U.S. Cl. 310—29 **9 Claims**

1. A portable hand-held electrical appliance comprising, a casing, a vibratory motor in the casing having a stator and an armature, said armature being pivotly mounted with respect to

the stator, a frame carrying the stator, and pivot means in said casing for suspending said motor within and spaced from the casing as well as providing for pivotal movement of the armature, said pivot means being the sole support for the motor within the casing and permitting pivotal movement of the motor with respect to the casing upon energization thereof.



3,906,264

ROTOR VIBRATION SUPPRESSING APPARATUS FOR MINIATURE ELECTRIC MOTORS

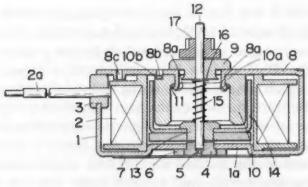
Tomohisa Kuwako, Anjo, and Tosio Tanase, Motosu, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Nov. 7, 1973, Ser. No. 408,124

Claims priority, application Japan, Oct. 20, 1972, 47-120609[U]

Int. Cl.[2] H02K *5/24*

U.S. Cl. 310—51 **5 Claims**



1. An electric motor having a rotor vibration-suppressing apparatus, comprising; a motor casing; an annular coil fixed in the casing and adapted for connection to a source of A.C. potential; an annular magnet fixed in said casing and being opposed to and spaced from said coil; a rotor having a portion disposed in the space between said coil and said magnet so that said rotor is rotated in synchronism with the frequency of the A.C. potential source when said coil is energized; a rotatable shaft concentric with said magnet, said rotor being fixed to said shaft for conjoint rotation therewith; first and second axially spaced bearings fixed in said casing and rotatably supporting said shaft; a compression coil spring surrounding said shaft and located between said bearings, said coil spring bearing at one end thereof against one of said bearings and bearing at the other end thereof against said rotor to continuously urge said shaft axially toward the other bearing, said other bearing having a central opening into which is received one end portion of said shaft, a member of hard material disposed in said opening and contacting the end wall of said one portion of said shaft, said compression coil spring continuously pressing said end wall against said member whereby said shaft is continuously supported by said member, thereby suppressing axial vibration of said shaft and said rotor and minimizing generation of vibration sound.

3,906,265

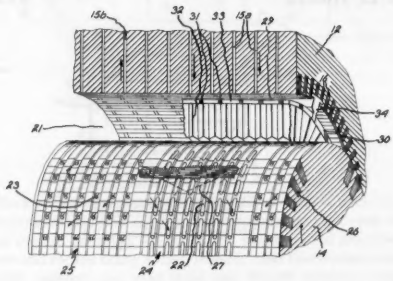
HONEYCOMB STATOR INSERTS FOR IMPROVED GENERATOR COOLING

Walter B. Giles, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1974, Ser. No. 470,061

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—55 **8 Claims**



1. A gas-cooled dynamoelectric machine comprising

a rotor mounted for rotation within a stator with an annular gap therebetween, and an air-tight casing enclosing said rotor and stator and means for cooling and recirculating a gas coolant within said casing,

means defining a plurality of axially spaced radial stator ducts for conducting coolant to and from said gap, and means defining a plurality of axially spaced inlet and outlet rotor ducts and connecting passages for taking coolant from said gap and circulating coolant through said rotor and back into said gap, and

at least one honeycomb stator insert mounted adjacent the inner surface of said stator extending into said gap to produce a substantially reduced effective gap clearance space and comprising a honeycomb baffle structure defining radial passages for coolant flow.

3,906,266

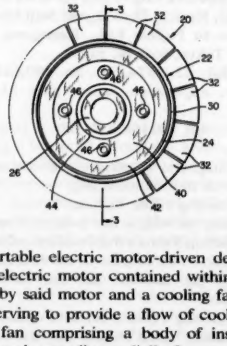
HIGH INERTIA INSULATING COOLING FAN FOR ELECTRIC MOTOR DEVICE

George Wilbur Cowman, Monkton, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Feb. 22, 1974, Ser. No. 444,700

Int. Cl.[2] H02K *9/06*

U.S. Cl. 310—60 R **1 Claim**



1. In a portable electric motor-driven device including a housing, an electric motor contained within said housing, a shaft driven by said motor and a cooling fan driven by said motor and serving to provide a flow of cooling air over said motor, said fan comprising a body of insulating material mounted on and extending radially from said shaft, the im-

provement wherein said fan body comprises a first, generally cup-shaped portion having a central aperture through which said shaft extends, said cup-shaped portion including a generally planar member extending radially from said shaft and said cup-shaped portion also including an axially extending lip formed on the radial extremity of said planar member; said fan body further including a plurality of fan blades extending radially outwardly from said lip; and a metallic inertial member fixed to said fan body within said cup-shaped portion, said inertial member including a first, radially extending part fixed to said planar member of said cup-shaped portion and said inertial member further including an axially extending lip disposed within said lip on said cup-shaped portion to provide a stabilizing inertial weight radially spaced from said shaft, said lip on said cup-shaped member partially enclosing said metallic inertial member to increase the effective tracking distance between said inertial member and electrically live portions of said electric motor.

3,906,267

BRUSHLESS ELECTRIC MOTORS

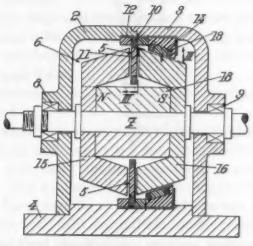
Claude Coupin, Eaubonne, and Alain Deval, Plaisir, both of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique, France

Filed May 16, 1974, Ser. No. 470,590

Claims priority, application France, July 26, 1973, 73.27485; Mar. 29, 1974, 74.11467

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 R 10 Claims



1. A D.C. brushless electric motor comprising a stator provided with a coiled power winding and a rotor comprising two side cheeks of magnetic material each having *n* teeth of like polarity, the side cheeks being arranged at the two sides of the stator in the axial direction and the magnetic flux provided by a member disposed radially inwardly the winding in the axial direction being closed parallel to the axis between the teeth of the side cheeks, wherein the power winding comprises 2*n* clusters of radially directed conductors, the axis of each cluster being offset electrically by 180° from that of the preceding cluster and the clusters being grouped so that two successive clusters are traversed by currents flowing in opposite directions, the said winding being embedded in an insulating annulus of moulded material which holds the clusters in position and has substantially parallel faces opposite the teeth of the side cheeks for the input and emergence of magnetic flux, which flux passes through non ferromagnetic material only between the said teeth, and that the stator carries detection means which are offset from the clusters of the power windings electrically through 90°.

3,906,268

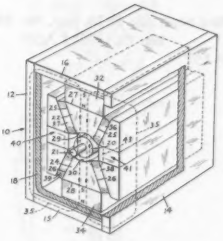
HIGH DENSITY FLUX MAGNETIC CIRCUIT

Albert L. de Graffenried, Glen Head, N.Y., assignor to Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.

Division of Ser. No. 147,824, May 28, 1971. This application Apr. 8, 1974, Ser. No. 459,222

Int. Cl.[2] H02K *21/28*

U.S. Cl. 310—154 10 Claims



1. A high flux electric motor, comprising:

a rotor;

at least one pair of polygonal pole pieces of magnetically permeable material each having at least four sides and a working air gap surface adjacent the rotor, at least two of said sides being disposed generally opposite the air gap surface and being related by an obtuse internal angle;

a magnetomotive source covering each of the sides of said pole pieces, each said source associated with a respective pole piece being similarly poled and having a magnetic axis generally normal to the surface of the pole piece side covered thereby so as to oppositely pole the respective air gap surfaces; and

a ferromagnetic motor casing contacting the magnetomotive sources and completing a magnetic flux circuit for each source through the pair of pole pieces and the rotor.

3,906,269

INERT INTERMEDIATE ADHESIVE LAYER FOR A FLUORESCENT SUBSTANCE IN A FLUORESCENT ELECTRONIC TUBE

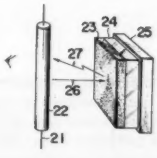
Mikiharu Tanji, Ise, Japan, assignor to Ise Electronics Corporation, Ise, Japan

Filed July 21, 1970, Ser. No. 56,818

Claims priority, application Japan, July 22, 1969, 44-69158[U]

Int. Cl. H01j *29/22*

U.S. Cl. 313—496 1 Claim



1. In a fluorescent electronic tube wherein a layer of fluorescent substance coated over a supporting member is excited to luminesce by electrons supplied from a cathode electrode disposed to oppose said supporting member, the improvement which comprises an intermediate layer which is interposed between said fluorescent substance and said supporting member, said intermediate layer being composed of a material which is inert to said fluorescent substance, which is adapted to conduct electrons so as not to interfere with the flow of

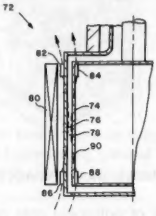
electrons when the fluorescent substance is energized to fluoresce, and which comprises a mixture of powdered carbon and water glass.

3,906,270

BIPOLAR CROSSED-FIELD SWITCH TUBE WITH UNIFORM MAGNETIC FIELD

Hayden E. Gallagher, and Wolfgang Knauer, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 18, 1974, Ser. No. 507,095
Int. Cl.[2] H01J *1/50*
U.S. Cl. 313—157 **9 Claims**



1. A crossed-field switch device comprising:

a cylindrical inner electrode, a hollow cylindrical outer electrode spaced around said inner electrode to define an annular gap in which a glow discharge cascading breakdown can be maintained, said gap having a lengthwise direction parallel to the axis of said electrodes, means for maintaining a subatmospheric gas pressure in said gap, the improvement comprising:

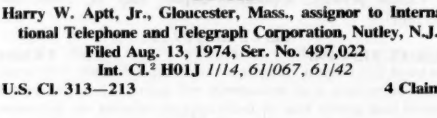
means for applying a potential at either polarity to said gap; Magnetic field means for producing a magnetic field which is substantially axial of said gap in the breakdown region of said gap so that either electrode can act as cathode with substantially the same voltage drop because of substantially the same amount of electron trapping in the breakdown region of said gap with application of potential of either polarity.

3,906,271

CERAMIC CUP ELECTRODE FOR A GAS DISCHARGE DEVICE

Harry W. Aptt, Jr., Gloucester, Mass., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 13, 1974, Ser. No. 497,022
Int. Cl.[2] H01J *1/14, 61/067, 61/42*
U.S. Cl. 313—213 **4 Claims**



1. A cup electrode for cold cathode gas discharge devices comprising:

a cup-shaped ceramic container having a forward open end for facilitating the emission of electrons therefrom and opposing closed end, said ceramic consisting of aluminum oxide, magnesium oxide and silicon oxide;

a quantity of thermionic emissive material formed from the exothermal reaction between a refractory metal powder and at least one alkaline earth peroxide within said container;

a passage through the closed end for providing electrical contact between the emissive coating contained within the electrode; and

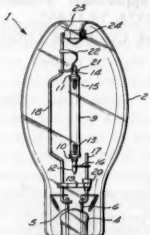
a metal lead wire extending through said passage for providing electrical connection with said electron emissive coating.

3,906,272

LOW WATTAGE HIGH PRESSURE SODIUM VAPOR LAMPS

Byron R. Collins, Twinsburg, and Charles I. McVey, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,622
Int. Cl.[2] H01J *17/04*
U.S. Cl. 313—214 **10 Claims**



1. A high pressure sodium vapor lamp for operation at a given power input in the range of 50 to 300 watts and at a given lamp voltage drop in the range of 20 to 180 volts comprising:

a tubular light-transmitting alumina ceramic envelope having thermionic electrodes sealed into its ends and containing inert starting gas and a charge of sodium-mercury-amalgam in excess of the quantity vaporized in normal operation;

the proportion of sodium in said charge being from 10 to 40% by weight;

said envelope being substantially uniform in bore in the space between the electrodes and being dimensioned in respect of bore and effective length for a loading in the range of 14 to 24 watts per square centimeter of envelope surface;

said envelope having a bore in the range of 3.0 to 7.5 millimeters, said bore being determined within ± 20% by the intersection of the given power input curve with the given lamp voltage line by utilizing the curves of FIG. 2 and interpolations therebetween;

said lamp being proportioned in respect of heat losses to the outside to have a temperature at the cold spot where the excess amalgam collects which results in a metal vapor pressure producing said given lamp voltage drop at which said bore is optimum for lamp efficacy.

3,906,273

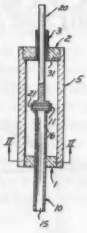
TWO ELECTRODE SPARK GAP APPARATUS

Joseph M. Kozlowski, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 16, 1974, Ser. No. 433,943

Int. Cl. H01j *17/16*

U.S. Cl. 313—220 **8 Claims**



1. A spark gap apparatus comprising:
a ceramic tube having a central axis;
a first base mounted at one end of said tube;
a second base comprised of glass mounted at the other end of said tube and forming with said first base and said tube an enclosure;
a first electrode mounted to said first base and extending into said enclosure along said central axis, said first electrode having a free end portion that includes an arc discharge surface;
a metal plate disposed inside of and transverse to the central axis of said tube, said metal plate being in contact with an annular portion of said second base and an annular portion of said tube;
a sleeve mounted to and extending through said second base; and
a second electrode mounted through said sleeve and said metal plate and extending into said enclosure along said central axis, said second electrode having a free end portion that includes an arc discharge surface which is spaced from and faces the arc discharge surface of said first electrode, said second electrode electrically isolated from said first electrode.

3,906,274

ELECTRODE DISCHARGE DEVICE WITH ELECTRODE-CTIVATING FILL

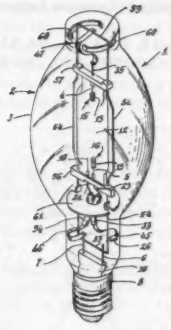
H. Graham Silver, Kings Point, N.Y.; Phillip J. Gardner, Danvers, Mass.; Adam Heller, Sharon, Mass., and Gary R. Argue, Winchester, Mass., assignors to GTE Laboratories Inc., Waltham, Mass.

Division of Ser. No. 212,458, Dec. 27, 1971, Pat. No. 3,771,009. This application Oct. 1, 1973, Ser. No. 402,567

Int. Cl. H01j *61/18*

U.S. Cl. 313—228 **20 Claims**

1. An electric discharge device comprising a sealed light-transmissive envelope; a pair of unactivated electrodes spaced within said sealed envelope, said electrodes being initially free of electron-emissive material which would function to lower the operating potential of said device during operation; and a fill within said envelope, said fill including at least one volatile complex having the formula $M'M_xI_{3x+3}$, where M′ represents a Group IIIB element, M represents a Group IIIA element selected from the group consisting of boron, aluminum, gallium, and indium, and $x = 3$ to 4, said complex serving to activate said electrodes during operation of said device whereby the need to initially provide electron-emissive material activated electrodes is eliminated, said volatile complex



being in sufficient quantity to constitute the primary light-emitting component of the fill.

3,906,275

ELECTRIC LAMP WITH ELECTROLYSIS PREVENTING APPARATUS

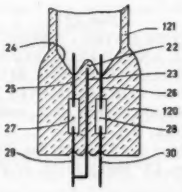
Raymond Francois Spiessens, and Walter Jan Roza Adolf De Rop, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,738

Claims priority, application Netherlands, May 4, 1973, 7306208

Int. Cl.² H01J *5/50, 61/36, 61/54;* **H01K** *1/38*

U.S. Cl. 313—318 **10 Claims**

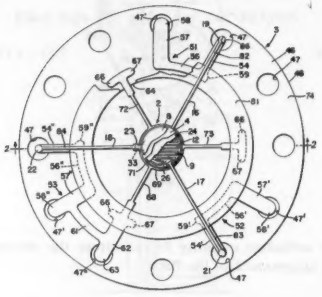


1. An electric lamp for use with an associated electric power supply which comprises: a radiation transmitting lamp envelope, means for sealing in a vacuum-tight manner at one end of said envelope, said means including a pinch, at least two current lead-through conductors extending through said pinch in sealed relation said lead-through conductors having an electric voltage comprising a direct voltage component being present between said conductors during operation of the lamp from the associated electric power supply, a metal screening element disposed in the pinch between the two current lead-through conductors, said screening element not intersecting the internal surface of the lamp envelope and being connected to the current lead-through conductor which at an average has a negative pontential relative to the other current lead-through conductor during operation.

3,906,276
INDIRECTLY HEATED CATHODE-HEATER ASSEMBLY AND SUPPORT MEANS THEREFOR

Anthony J. Barraco, San Jose, and Albert M. Rockwell, Jr., Belmont, both of Calif., assignors to Anthony J. Barraco, San Jose, Calif.

Filed Jan. 18, 1974, Ser. No. 434,574
Int. Cl.² H01J *1/20, 19/14*
U.S. Cl. 313—337 **53 Claims**

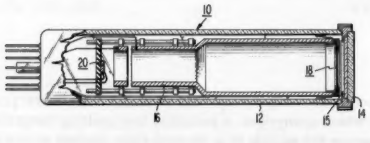


1. In combination, a cathode support structure and cathode-heater assembly supported thereon, comprising:
a. a pair of dielectric mounting rings arranged in end-to-end relation and bonded to one another;
b. electrically conductive terminal means sandwiched between opposed ends of said mounting rings and including a plurality of resilient tensioning members; and
c. a cathode-heater assembly suspended on said mounting rings and including at least a pair of radially extending electrically conductive support legs electrically connected to said tensioning members so that a radially outwardly directed tensioning force is imposed on said support legs.

3,906,277
ELECTRON TUBE HAVING A SEMICONDUCTOR COATED METAL ANODE ELECTRODE TO PREVENT ELECTRON BOMBARDMENT STIMULATED DESORPTION OF CONTAMINANTS THEREFROM

Horst Ernst Paul Schade, Mercer, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 5, 1972, Ser. No. 250,804
Int. Cl.² H01J *31/28, 31/26*
U.S. Cl. 313—365 **5 Claims**

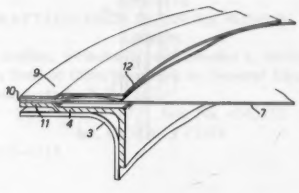


1. An improved electron tube of the type having:
a. an evacuated envelope;
b. an electron emitting cathode mounted within said envelope, said cathode having a cesiated layer thereon;
c. at least one electrode in said envelope for controlling electron flow from said cathode;
d. means for energizing electrons emitted from said cathode to an energy of at least 20 electron volts; and
e. at least one metal surface within said envelope in the path of said emitted electrons;
wherein the improvement comprises a clean, nonporous coating of semiconductor material on said metal surface to inhibit desorption of gases from said surface when said surface is struck by electrons.

3,906,278
CAMERA TUBE MESH CLAMPED BETWEEN DISHED ANNULAR MEMBERS

Laurence Henry Horton, Witham, and Peter Harvey Batey, Chelmsford, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 15, 1974, Ser. No. 514,484
Int. Cl.² H01J *29/08, 31/38, 29/02*
U.S. Cl. 313—383 **4 Claims**

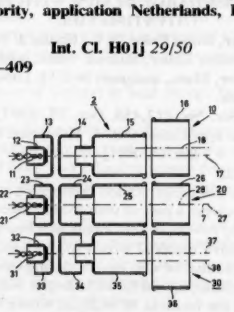


1. A television or like camera cathode ray tube having a fine conductive mesh adjacent the target of the tube wherein said fine conductive mesh is clamped around its periphery between two annular members and an annular washer of flexible material is also clamped between said two members and in contact with said fine conductive mesh, said washer extending inwardly beyond the region of clamping by said two members towards the useful picture area of the fine conductive mesh and the inner regions of said two members being dished beyond the region of clamping away from each other and said fine conductive mesh, whereby the dished portion of that clamping member in contact with said washer acts to restrict the degree to which the portion of said washer beyond the region of clamping may lift away from said fine conductive mesh so as to cause said damping washer to exhibit corrugations in the space between the fine conductive mesh and the dished portion of that clamping member in contact with the washer, so that said washer in said space contacts at different places said fine conductive mesh and the dished portion of that clamping member.

3,906,279
CATHODE-RAY TUBE FOR DISPLAYING COLOURED PICTURES

Henricus Wilhelmus Maria Linssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,582
Claims priority, application Netherlands, Dec. 16, 1972, 7217179
Int. Cl. H01j *29/50*
U.S. Cl. 313—409 **4 Claims**



1. A cathode-ray tube for displaying color pictures comprising in an evacuated envelope: three electron guns the axes of

which are parallel to the main axis of the tube for producing three electron beams, a color selection electrode comprising a multitude of apertures, a display screen having three patterns of regions luminescing in different colors, means for converging the three electron beams so that they intersect each other near the color selection electrode, each of said electron beams being assigned to one of the said patterns by means of the color selection electrode, each of said electron guns comprising a set of successively arranged electrodes including at least a cathode, a control grid, an anode and an additional last electrode which has the form of a substantially cylindrical sleeve, at least two electron guns having respectively, a center axis which is eccentric relative to the main axis of the tube, the last electrode of each of said two eccentric electron guns having a center axis which is eccentric relative to the center axis of the assigned electron gun in a plane through the main axis of the tube and the center axis of the assigned electron gun and at a larger distance from the main axis of the tube than is the axis of the assigned electron gun, and said last electrode having an inner diameter which is larger than the largest inner diameter of any other electrode of the assigned electron gun.

3,906,280

ELECTRON BEAM PRODUCING SYSTEM FOR VERY HIGH ACCELERATION VOLTAGES AND BEAM POWERS

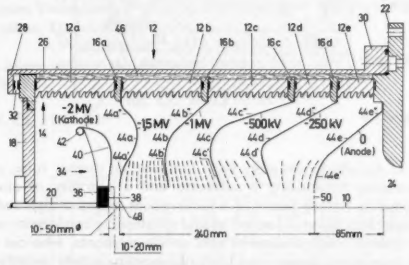
Claus Andelfinger, Haar; Walter Dommaschk, Garching; Werner Ott, Garching; Manfred Ulrich, Garching, and German Weber, Munich, all of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Germany

Filed June 22, 1973, Ser. No. 372,582

Claims priority, application Germany, June 22, 1972, 7223397

Int. Cl.[2] H01J *29/46*

U.S. Cl. 313—449 **13 Claims**



1. An electron beam producing system for acceleration voltages in the order of magnitude of megavolts and beam powers in the order of magnitude of gigawatts, comprising a tubular housing of insulating material, in which adjacent to its one closed end a field emission cathode with a large surface area is arranged while at its other end, from which the electron beam emerges, an annular anode is arranged, and with a device for collimating the electrons emitted by the cathode to form a collimated electron beam, characterized in that: the device for collimating the electron includes annular electrodes, which respectively comprise a part adjacent to their center opening and an outer part which is held on the housing and has a radial electrical passage extending towards the outside of the housing; the inner part of the electrode lying closest to the cathode has at least approximately the shape of a frusto-conical surface which tapers towards the cathode; the inner part of the remaining electrodes is flat and lies in an equipotential surface of an electric field, which collimates the electrons, emitted by the cathode, to form a parallel beam; the housing is surrounded by a coaxial insulating casing with a clearance; in that the intermediate space between the outer surface of the housing and the casing is surrounded with an electrically conducting liquid with a relatively high specific resistance and at the axial ends has a respective connection electrode, which makes contact with the liquid, for the operating voltage and that the outer parts of the electrodes are so shaped that the radial passages end at those sites of the liquid filled intermediate space at which the fraction, provided for the relevant electrode, of the operating voltage obtains when the operating voltage is applied to the connection electrodes.

3,906,281

COLOR CATHODE RAY TUBE HAVING GAS FOR CONDUCTION OF HEAT FROM SHADOW MASK

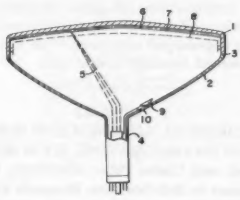
Koji Nakamura, and Hisao Nakahishi, both of Kyoto, Japan, assignors to Mitsubishi Kenki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1973, Ser. No. 355,100

Claims priority, application Japan, May 8, 1972, 47-45129

Int. Cl. H01j *29/00, 31/20*

U.S. Cl. 313—481 **3 Claims**



1. An improved shadow mask color cathode-ray tube comprising:

an air-tight tube comprising a panel and a funnel having a neck part and a funnel part wherein the funnel part is sealed to said panel to form an air-tight enclosure,

a fluorescent screen having numerous three color fluorescent dots arranged in a pattern and disposed within said tube adjacent to said panel,

three electron guns disposed within said tube for emitting three electron beams having an energy of about 26 KV and 1.0 mA which strike said fluorescent dots causing them to fluoresce where struck,

a shadow mask containing numerous openings corresponding to the pattern of the three color fluorescent dots disposed within said tube adjacent said fluorescent screen between said fluorescent screen and said electron guns,

a gas having a low specific heat disposed in said tube at a partial pressure in the range of 10^{-2} to 10^{-7} Torr., for distributing to the walls of said tube the heat caused by said electron beams striking said shadow mask thereby preventing thermal deformation of said shadow mask.

3,906,282

PRECISION GETTER ALIGNMENT FOR CATHODE RAY TUBES

Elliott M. Krackhardt, North Syracuse, and William J. Nolan, Syracuse, both of N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Feb. 19, 1974, Ser. No. 443,761

Int. Cl.[2] H01J *29/00, 19/70*

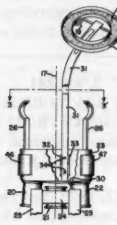
U.S. Cl. 313—481 **8 Claims**

1. In a cathode ray tube including electron gun means for producing at least one beam of electrons, generally cup-shaped apparatus situated at the end of said electron gun means from which said electrons are emergent, said generally cup-shaped apparatus including a side wall, and means located within said tube for gettering gases therein, apparatus for

retaining said means for gettering gases in precise alignment on a radial axis of said tube comprising:

a predetermined configuration of getter material;

a channel formed longitudinally in the side wall of said generally cup-shaped apparatus, said channel including sides formed by introverted segments of said side wall and



a web portion formed by the portion of said side wall situated between said segments, and a member supporting said configuration of getter material, said member being positioned within said channel and affixed to said generally cup-shaped apparatus so as to extend toward a predetermined location in said tube.

3,906,283

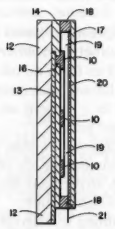
ELECTROCHEMICAL LUMINESCENT SOLUTIONS AND DEVICES INCORPORATING SUCH SOLUTIONS

Allen J. Bard, and Csaba Peter Keszthelyi, both of Austin, Tex., assignors to Bell-Northern Research Ltd., Canada

Filed Sept. 6, 1973, Ser. No. 394,640

Int. Cl.[2] H01J *1/62, 63/04*

U.S. Cl. 313—483 **34 Claims**



1. In an electrochemical luminescent solution for an electro-generated chemiluminescent device, said solution including a luminescor component, an aprotic solvent and an electrolyte, the improvement wherein the luminescor component comprises a luminescor compound and an added compound, one of said compounds an oxidant and the other of said compounds a reductant at the operating potential of said device, said oxidant and reductant reactive as an energy sufficient system for light emission.

3,906,284

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH AMALGAM

Gunter Franck, Ebenhausen, and Lothar Busch, Munich, both of Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany

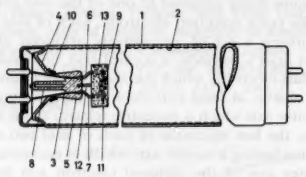
Filed July 23, 1974, Ser. No. 490,986

Claims priority, application Germany, Aug. 1, 1973, 2339056

Int. Cl.[2] H01J *61/28*

U.S. Cl. 313—490 **23 Claims**

13. An electrode-containing component for fluorescent lamps comprising an electrode connected to an electrode positioning means, and having an amalgam which determines the equilibrium vapor pressure during operation of the lamp coated on at least a portion of said electrode positioning means, said amalgam comprising mercury and an amalgam-forming composition containing at least two amalgam-forming



constituents, the improvement wherein said amalgam-forming composition comprises a first amalgam-forming constituent selected from the group consisting of the alkali metals and the alkaline earth metals, and a second amalgam-forming constituent which comprises indium.

3,906,285

LUMINESCENT DISPLAY TUBE ANODE ASSEMBLY COMPRISING ANODE SEGMENTS EACH HAVING A TUNGSTEN CARBIDE CONDUCTIVE LAYER

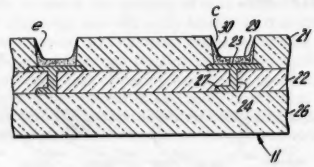
Masaki Kobayakawa, and Kazufumi Yawata, both of Izumi, Japan, assignors to Nippon Electric Kagoshima, Ltd., Kagoshima, Japan

Filed May 8, 1974, Ser. No. 468,065

Claims priority, application Japan, May 15, 1973, 48-57504

Int. Cl.[2] H01J *1/66, 63/02*

U.S. Cl. 313—496 **1 Claim**



1. An anode assembly for a luminescent display tube, said assembly comprising a substrate and a plurality of anode segments having layers of a luminescent material disposed in respective recesses formed in said substrate in conformity with a desired configuration of said anode segments, wherein the improvement comprises a layer of tungsten carbide underlying each of said luminescent material layers.

3,906,286

HOT-CATHODE INDICATOR TUBE FOR DISPLAYING LUMINESCENT FIGURES

Fumitake Akahane; Tsunekiyo Iwakawa; Hideyo Imai; Hiroshi Okazaki, and Toshio Wada, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Nishishinba, Japan

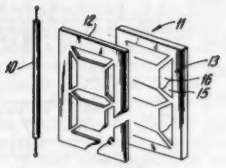
Continuation of Ser. No. 309,354, Nov. 24, 1972, abandoned, which is a continuation of Ser. No. 122,052, March 8, 1971, abandoned. This application Feb. 12, 1974, Ser. No. 441,812

Int. Cl.[2] H01J *63/02*

U.S. Cl. 313—496 **3 Claims**

1. In a phosphor indicator tube for displaying at least one luminescent figure at a time, said tube comprising an evacuated sealed envelope, an anode structure within said envelope and having a base plate formed of an insulating material and provided with a plurality of phosphor anode segments, means placed in front of said segments for emitting thermal electrons, means for supplying a positive potential selectively to

said anode segments, and means for distributing, in cooperation with the anode segments supplied with said positive potential, said electrons substantially uniformly on said anode segments, the improvement which comprises: at least one set of grooves formed in said base plate, each said set of grooves conforming in geometric configuration and dimension to a set of figures to be displayed, said anode segments each comprising an electroconductive film respectively deposited on the entire surface of the bottom wall of said set of grooves in electric contact with said positive potential supplying means,



and a phosphor film respectively filling said grooves over said electroconductive film, and having a peripheral end extending along the periphery of said grooves from said electroconductive film substantially to the front surface of said base plate, whereby those segments in said groove set to which said positive potential is supplied serve to clearly and distinctly display said luminescent figure selected from said set of figures without the use of an additional mask or electrode located between said electron distributing means and said anode structure.

3,906,287

INDICATOR DISPLAY TUBE HAVING PREDETERMINED SPACING BETWEEN BASE PLATE AND COVER

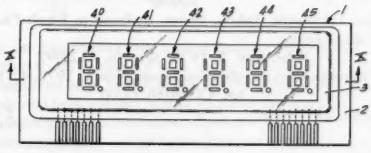
Yuzuru Yanagisawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 15, 1972, Ser. No. 234,969

Claims priority, application Japan, Mar. 20, 1971, 46-15945

Int. Cl.² H01J *61/66*

U.S. Cl. 313—519 **5 Claims**



1. An indicator display tube comprising:
an envelope including a transparent cover and a plate of insulating material with the edges sealed together,
a plurality of indicator units arranged in line in a longitudinal direction thereof, each of said plurality of indicator units consisting of a plurality of cathode segments and at least one anode for each indicator unit and said cathode segments being coated on said plate and said indicator units being successively energized,
the spacing between the inside surface of said transparent cover and said plate to the maximum length of the cathode segments forming a single indicator unit being between 0.05 and 0.4,
a plurality of cathode leads corresponding to the number of cathode segments and each connected to corresponding ones of said cathode segments of said indicator units and extending longitudinally of said indicator units,
a plurality of anode leads each connected to said anode of each of said indicator unit,
a plurality of first external leads connected to corresponding ones of said cathode leads and arranged in line and at right angles to said cathode leads,
a plurality of second external leads each respectively connected to one of said anode leads and lying parallel to said first external leads, and
an ionized gas sealed in said envelope,

3,906,288

DEFLECTION COIL SYSTEM FOR COLOR TELEVISION

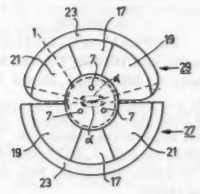
Jan Hendrik Duistermaat, and Constantius Johannes Waltherus Panis, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 399,859

Claims priority, application Netherlands, Oct. 6, 1972, 7213541

Int. Cl.² H01J *29/50*

U.S. Cl. 315—13 C **2 Claims**



1. A deflection coil system which is adapted to be arranged about a color television display tube at the area where a rearmost cylindrical part of said display tube which comprises electron guns, changes over into a flared foremost part which is provided with a display screen, the said deflection coil system comprising an upper and a lower saddle-shaped horizontal deflection coil, each coil comprising at least one conductor which extends about a window in a plurality of turns, each of the horizontal deflection coils comprising two active parts situated on both sides of the window where the conductors extend in the longitudinal direction of the display tube along the surface of the display tube, and a foremost and a rearmost coil head where the conductors extend substantially perpendicular to the conductors in the active parts, the said coil heads having approximately the shape of a part of a flat ring which is perpendicular to the axis of the display tube, the ends of said ring being arranged at a given angle distance from each other, and means for correcting landing errors comprising the value of the said angle distance at the foremost coil heads is different for the two horizontal deflection coils and said coils being asymmetrical about a horizontal plane and symmetrical about a vertical plane.

3,906,289

METHOD OF COMPRESSING AN ARC DISCHARGE

Vladimir Romanovich Lepp, Chapaevsky pereulok, 14, kv. 121; Vladimir Alexeevich Vinogradov, 4 ulitsa Mariinoi Roschi, 2, korpus 1, kv. 26; Kharis Malikovich Sibgatulin, Beskudnikovsky bulvar, 32, korpus 4, kv. 56, and Jury Nikolaevich Cherkasov, Proezd Cherskogo, 9, kv. 35, all of Moscow, U.S.S.R.

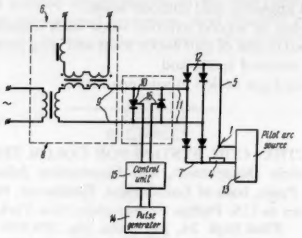
Filed Jan. 10, 1974, Ser. No. 432,333

Int. Cl.² H05B *7/148, 7/20*

U.S. Cl. 315—111 **2 Claims**

1. A method for compressing an arc-discharge column, comprising the following steps: spacing electrodes at a distance sufficient to form an arc gap; supplying shielding gas to said electrodes; applying to said electrodes current pulses having a duration less than the time period during which the

arc-discharge column expands to a steady-state value; ceasing to apply current pulses to said electrodes for a time period



sufficient to bring the arc-discharge column to the initial state; alternately applying said current pulses to said electrodes to be followed by a discontinuation thereof.

3,906,290

DISPLAY APPARATUS

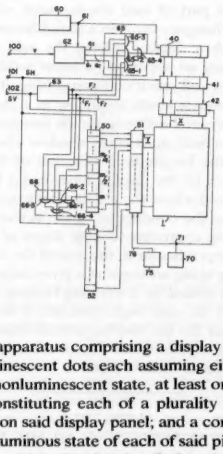
Koichiro Kurahashi, and Hiroshi Tottori, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 19, 1973, Ser. No. 398,791

Claims priority, application Japan, Jan. 16, 1973, 48-7228; Jan. 16, 1973, 48-7230; Feb. 7, 1973, 48-15422; Feb. 7, 1973, 48-15423; Feb. 7, 1973, 48-15424; Feb. 8, 1973, 48-16004; Feb. 8, 1973, 48-16005

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 R **26 Claims**



1. A display apparatus comprising a display panel having a plurality of luminescent dots each assuming either a luminescent state or a nonluminescent state, at least one of said luminescent dots constituting each of a plurality of picture elements disposed on said display panel; and a control device for controlling the luminous state of each of said picture elements according to the video signal to be displayed on said display panel; wherein said control device is operated so that each of said picture elements is turned on with a mean brightness proportional to the instantaneous value of said video signal; the control device being operated so that the instantaneous value V of said video signal corresponding to each of said picture elements is coded by the use of n weights $w_1, w_2, w_3 \ldots, w_n$, according to the formula

$$V = K(a_1w_1 + a_2w_2 + a_3w_3 + \ldots + a_nw_n)$$

where $a_1, a_2, a_3, \ldots, a_n$ represents a value of 1 or 0, and K represents a conversion constant; and wherein each of said picture elements is turned on with a mean brightness proportional to the weight w_k corresponding to the condition $ak = (k = 1, 2, 3, \ldots, n)$.

3,906,291

ARC GENERATOR FOR AN EMISSION SPECTROMETER

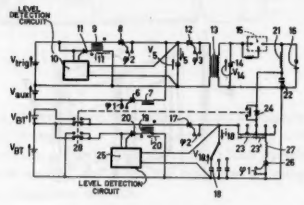
Raymond Georges Schayes; Pol Ambroise Ghislain Joseph Gustin, both of Brussels, and Jean Fernand Raymond Schmitz, Ganshoren, all of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,181

Claims priority, application Belgium, Sept. 29, 1972, 789436

Int. Cl.² H05B *41/22, 41/30*

U.S. Cl. 315—171 **9 Claims**



1. An arc generator for an emission spectrometer comprising, a pair of spaced electrodes defining an arc gap therebetween, an ignition circuit for generating a voltage capable of igniting an arc across said pair of electrodes, said ignition circuit comprising a capacitor, a charge circuit for the capacitor that includes a first source of DC voltage and a capacitor discharge circuit that includes a controlled rectifier device for selectively coupling the capacitor to said electrodes, and a low-voltage circuit including only reactive circuit elements for maintaining the discharge across the electrodes and comprising, a second capacitor and an inductor coupling the second capacitor to the pair of electrodes to provide a discharge path for the second capacitor across the electrodes and via said inductor, and a control circuit for controlling an energy current for the discharge across said pair of electrodes, said control circuit comprising a thyristor and a coil in series with the second capacitor across a source of DC voltage, and a further thyristor controlled by a level-detection circuit with input terminals coupled across the second capacitor.

3,906,292

DEVICE FOR CONTROLLING LIGHTING TIME OF LAMP

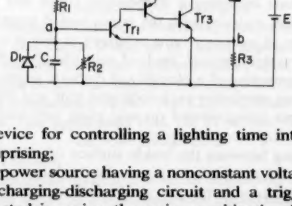
Akira Takahashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1973, Ser. No. 412,097

Claims priority, application Japan, Nov. 6, 1972, 47-110250

Int. Cl. H05b *37/00*

U.S. Cl. 315—208 **5 Claims**



1. A Device for controlling a lighting time interval of a lamp, comprising;

a. a DC power source having a nonconstant voltage output;

b. a charging-discharging circuit and a trigger switch connected in series, the series combination being connected in parallel with said DC power source and charged to a constant predetermined voltage when the trigger switch is closed, and then discharged when the trigger switch is opened;

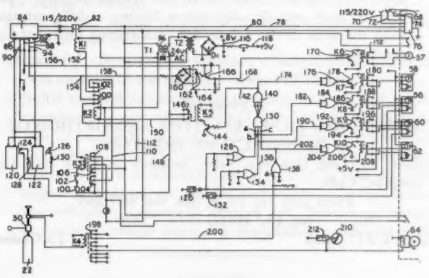
c. a switching circuit having two states connected to said charging-discharging circuit;
d. a lamp connected to said switching circuit so as to be turned on and off in response to the state of said switching circuit;
e. a series circuit comprising a resistor and means for obtaining a constant voltage, said series circuit being connected in parallel with said DC power source to obtain a voltage at the junction of the resistor and the constant voltage means which is the voltage of the DC power source less the constant voltage drop of said constant voltage means; and
f. a switching element having a control terminal and a reference terminal in said switching circuit, said control terminal being connected to said charging-discharging circuit and said reference terminal being connected to the junction between said means for obtaining a constant voltage and said resistor, the difference between the voltage at the control terminal and the voltage at the reference terminal being an inverse function of said DC power source voltage output and the voltage difference controlling the state of said switching circuit such that said switching circuit turns on said lamp for a longer time interval as said DC power source voltage output decreases.

3,906,293

ELECTROPHORESIS TESTING APPARATUS

Alex Meshbane, 5 Patricia Ln., Syosset, N.Y. 11791, and Frank Vilardi, 9 Brookstan Rd., Nesconset, N.Y. 11767

Filed Jan. 28, 1974, Ser. No. 437,055
Int. Cl. H02h *3/00, 5/04*
U.S. Cl. 317—18 R **5 Claims**



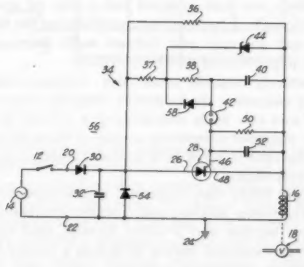
1. In an electrophoresis testing apparatus adaptable for connection to an external power source and having an enclosure connected to a high voltage power supply having input terminals and high voltage output terminal means, tank means for containing electroconductive fluid and at least one enclosure door permitting access to the interior of said enclosure; an electric shock and fire protection system comprising ground fault interrupter means operative to detect a ground fault in said electric shock and fire protection system having its input terminal means adaptable for connection to said external A.C. power source and output terminal means, high voltage circuit means connected between said high voltage output terminal means and said tank means, first switch means having input terminal means and output contact means operative to selectively connect said high voltage power supply input terminals to said ground fault interrupter output terminal means, door interlock switch means operative to be rendered into open and closed conditions when said enclosure door is in the open and closed positions respectively, said first switch means being operative in response to said door interlock switch means to interrupt the flow of power from said power source through said ground fault interrupter means to said high voltage input terminals when said enclosure door is in the open position; low voltage power supply means comprising input and output terminals, said low voltage output terminals being connected to said ground fault interrupter output terminals, said first switch means input terminal means comprising a pair of input terminals with one of said first switch means input terminals connected to one of said low voltage output terminals; second switch means comprising input terminal means and output contact means connected to the second of said first switch means input terminals, whereby said first switch means is operative to interrupt the flow of power from said power source to said high voltage input terminals in response to said second switch means; said door interlock switch means comprising output contact means connected to said second switch output contact means whereby said second switch contact means is operative in response to said door interlock switch means to interrupt the flow of power from said low voltage power supply means to said first switch means to thereby cause interruption in the flow of power from said external power source to said high voltage power supply input terminals; and third switch means comprising input terminal means and output contact means connected to said second switch means input terminal means, said second switch means being operative in response to said third switch means output contact means to interrupt the flow of power from said low voltage supply terminals to said first switch means input means.

3,906,294

TIME DELAYED SOLENOID VALVE

Ronald F. Lourigan, Kenoshia, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed July 2, 1973, Ser. No. 375,650
Int. Cl.[2] H01H *47/18*
U.S. Cl. 317—141 S **5 Claims**



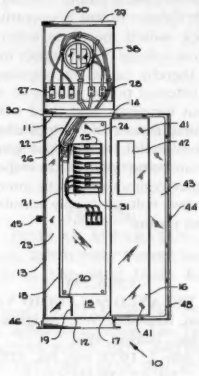
1. A time delayed control circuit adapted to be coupled to a source of AC power to energize a solenoid coil, said control circuit comprising:
a half wave rectifier means coupled to said source of AC power;
a controlled conduction means coupled to said half wave rectifier means and said solenoid coil;
a timing circuit coupled to said half wave rectifier means and said controlled conduction means, said timing circuit rendering said controlled conduction means operable to supply said solenoid coil with power from said half wave rectifier means after a predetermined time subsequent to the supplying of said half wave rectifier means with power from said source of AC power; and
a latching circuit means including said solenoid coil and a rectifier means coupled to said controlled conduction means to maintain said controlled conduction means operable during the time in which said half wave rectifier means in receiving power from said source of AC power and in which said controlled conduction means is not maintained operable by said half wave rectifier means.

3,906,295

SERVICE PEDESTAL FOR ELECTRICAL CONTROL MEANS INCLUDING A METER

Wallace David Tessmer, 9182 Rundelay Way, Sacramento, Calif. 95826

Filed Feb. 5, 1974, Ser. No. 439,958
Int. Cl.[2] H02B 9/00
U.S. Cl. 317—107 21 Claims



1. A service pedestal for an electrical control system or the like wherein the pedestal is adapted to be mounted on a supporting surface and said pedestal has a pair of upstanding elongated side walls, a back wall interconnecting the side walls and back wall and top and bottom walls interconnected thereto, the improvement which comrpises:

a. A selectively closable inner door, having at least one opening extending therethrough, hingedly connected to one of said side walls and forming a cabinet having an interior chamber completely sealed off from the environment when said inner door is in closed position, said hinge being removeable,

b. cable and utility wire clearance means mounted in the interior chamber dividing said chamber into two sections, a narrow section and a water section, said cable and utility wire clearance means including a barrier having a first portion extending upwardly within said chamber from the bottom thereof generally parallel to the plane of one of said side walls and spaced therefrom, then includes a second portion integral with said first portion extending toward said one of said side walls and spaced therefrom, generally normal to said first portion and generally parallel to the surface on which said pedestal would be mounted, when said pedestal is mounted on a surface, then includes a third portion connected to said second portion extending upwardly within said chamber generally parallel to the plane of said one of said side walls but spaced from said one of said side walls, then includes a fourth portion integral with said third portion extending inwardly toward the central longitudinal axis of said chamber at an angle from the vertical and toward said top wall, said third portion being relatively longer than both said first and fourth portions, the spacing between said third portion and said one of said side walls being substantially less than the spacing between said third portion and the other of said side walls,

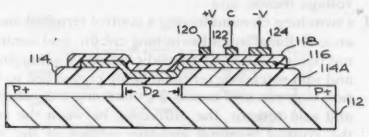
c. a selectively closable outer door hingedly connected to one of said side walls and completely sealing off both sections of said chamber and said first mentioned inner door when the outer door is in closed position.

3,906,296

STORED CHARGE TRANSISTOR

Joseph Maserjian, La Crescenta, and George W. Lewicki, Studio City, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 849,057, Aug. 11, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 174,684
Int. Cl. H01l 11/14
U.S. Cl. 357—7 4 Claims



1. A charge-storage device comprising a substrate having a first continuous insulating layer deposited or grown thereon, said first insulating layer having one area thereof which is thinner than the remainder of the area of said first insulating layer,

a conducting layer deposited over both thin and thick areas of said first insulating layer,

a second insulating layer deposited over and completely covering said conducting layer, and

electrode means coupled to said storage charge device for applying charge thereto and for deriving charge therefrom, said electrode means constituting a plurality of spaced metallic depositions on said second insulating layer which is over a portion of said conducting layer, the area of each metallic deposition having a different size than the area of the others for establishing different capacitances.

3,906,297

METALLIZED FILM CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Delbert E. Hunt, Ogallala, Nebr., assignor to TRW Inc., Los Angeles, Calif.

Filed July 10, 1974, Ser. No. 487,249
Int. Cl.[2] H01G 1/14, 13/00
U.S. Cl. 317—258 13 Claims

1. In a method of manufacturing capacitors wherein elongate thermoplastic dielectric films having a metal coating conductor associated therewith are wound into a coil and conductive metal electrodes are bonded to each axial end of such coil to form an electrical contact with the conductive windings, the steps in combination therewith comprising:

shaping an elongate conductor lead to form an L-shape having an elongate portion and a foot portion;

positioning said L-shaped lead against one of said electrodes so that said foot portion extends from near center of the axial end of said windings and radially outwardly there-

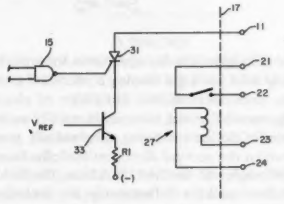
from to an outer circumferential edge of said one of said electrodes; and

mechanically and electrically bonding said foot portion of said lead to said metal electrode by applying heat thereto, whereby any damage to the interface between said metal electrode and the conductive windings caused by the presence of heat during bonding of said lead is limited to brief segments of the full circumferential extent of each winding interface.

3,906,298
PROTECTIVE APPARATUS FOR DIGITAL LOGIC CIRCUITS

Tage Peter Sylvan, Milton, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Jan. 28, 1974, Ser. No. 437,337
Int. Cl.² H02H *3/20, 7/09*
U.S. Cl. 317—33 SC **10 Claims**



1. Digital logic signal output apparatus which is protected against externally applied voltages substantially outside of digital logic levels, said apparatus comprising:

an output terminal;

an SCR, the anode of said SCR being connected to said output terminal;

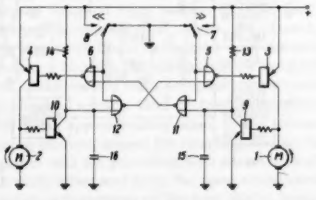
means for continuously applying a substantially constant bias current to the cathode of said SCR; and

a digital logic circuit means for applying a digital logic signal at either of a pair of preselected logic voltage levels to the gate of said SCR, said logic level signals being transferred from the gate to the anode of said SCR with the anode operating as a non-linear current source or sink at either digital logic level, the output current value being limited for voltages substantially outside said digital logic range, the excess voltage appearing essentially across said SCR.

3,906,299
APPARATUS FOR RAPID BRAKING OF MAGNETIC TAPE

Rainer Mittelstaedt, Nurnberg, Germany, assignor to Grundig E.M.V. Electro-Mechanische Versuchsanstalt, Ruerth, Germany

Filed Mar. 21, 1974, Ser. No. 453,370
Claims priority, application Germany, Mar. 27, 1973, 2315118
Int. Cl.² B65H *59/38*
U.S. Cl. 318—7 **8 Claims**

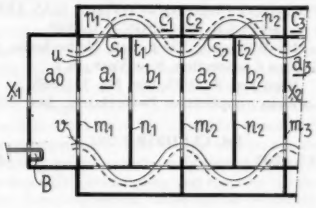


1. Apparatus for the rapid braking of a magnetic tape, when a rapid tape transport switch is switched off in a magnetic tape device including separate and interchangeably operable direct-current tape winding motors one of which drives the tape onto a take-up reel and the other of which is an idling motor which is driven through the tape, and wherein the last idling motor is activated in opposite direction until the tape stops, when the last operated motor is switched off, said apparatus comprising first and second transistors including base-emitter circuits respectively coupled to said motors, and logical connecting circuit means, each said transistor being controlled as to its conductivity by an operating voltage supplied by the associated motor, each said transistor including a collector having a potential adapted to excite the driven motor through said logical connecting circuit when the drive motor is switched off for as long as the induced EMF supplied by the switched off motor exceeds a prescribed value.

3,906,300
MULTIPERIODIC ACCELERATOR STRUCTURES FOR LINEAR PARTICLE ACCELERATORS

Duc Tien Tran, Paris, France, assignor to C.G.R.-Mev., Paris, France

Filed July 5, 1973, Ser. No. 376,584
Claims priority, application France, July 7, 1972, 72.24746
Int. Cl. H01j *25/10*
U.S. Cl. 315—5.42 **8 Claims**



1. A linear structure for a linear accelerator comprising an input cavity and a plurality of successive pairs of accelerating cylindrical resonant cavities, means including coupling apertures for coupling said pairs of cavities, means for coupling said cavities forming each said pair to each other comprising a plurality of annular cavities each coupled through apertures to one of said pairs of cavities, said annular coupling cavities arranged coaxially with said cylindrical resonant cavities and located at the periphery thereof; and means for feeding electromagnetic energy into said input cavity.

3,906,301
COMPUTERIZED LIGHTING SYSTEM

Dalziel L. Fisher, 816 N. Battin, Wichita, Kans. 67208

Filed May 30, 1974, Ser. No. 474,596
Int. Cl.² H05B *39/00*
U.S. Cl. 315—97 **7 Claims**

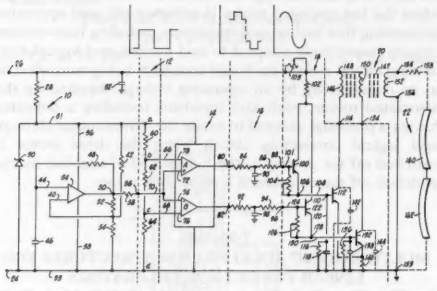
1. An apparatus for converting d.c. current to a.c. current comprising:

a. a multivibrator, having a pair of input terminals for receiving a direct current operating potential,

b. a differentiator having a dual operational amplifier, operably connected to said multivibrator, said differentiator having a substantially square wave form output in two separate output currents,

c. a wave shaper filter operably connected to said differentiator to shape said substantially square wave form currents to have shapes substantially that of a sine wave and a cosine wave, respectively,

c. an amplifier operably connected to said wave shaper filter, and



e. a transformer having the primary portion operably connected to said amplifier and the secondary portion operably connected to a load.

3,906,302

ARRANGEMENT PROVIDED WITH A GAS AND/OR VAPOUR DISCHARGE LAMP

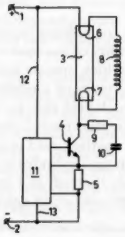
Dan Bernardus Wijsboom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1973, Ser. No. 321,655

Claims priority, application Netherlands, Jan. 19, 1972, 7200720

Int. Cl.[2] H05B *37/02*

U.S. Cl. 315—209 14 Claims



1. An arrangement for energizing an electric discharge lamp having a pair of electrodes for defining a current path through the lamp comprising, a pair of input terminals for supplying an operating voltage to said arrangement, a controlled switching element connected in series circuit with the lamp across said input terminals of the arrangement, a control device coupled to a control electrode of the switching element for switching the switching element on and off at a minimum frequency of 400 times per second, an inductor connected in a branch circuit in parallel with said lamp so that currents flow in parallel through the lamp and the inductor in the operative condition of the lamp and with the switching element conductive, and means responsive to the cut off of current in the switching element for generating a voltage across the lamp which is at least equal to the re-ignition voltage of said lamp.

3,906,303

COLOUR TELEVISION DISPLAY APPARATUS INCORPORATING A TELEVISION DISPLAY TUBE

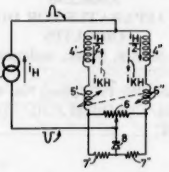
Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,433

Claims priority, application Netherlands, Dec. 15, 1972, 7217050

Int. Cl.[2] H01J *29/56*

U.S. Cl. 315—370 8 Claims



1. Colour television display apparatus incorporating a television display tube having a display screen and two deflection coils for the deflection in two directions of electron beams which are generated in the tube substantially in one plane, a first direction of deflection being substantially parallel to the said plane whilst the second direction of deflection is substantially at right angles to the first direction, the field generated by the deflection coil for deflection in the first direction having a distribution in which its meridional image plane substantially coincides with the screen whilst the field generated by the deflection coil for deflection in the second direction has a distribution in which its sagittal image plane substantially coincides with the screen, the deflection errors due to comma and anisotropic astigmatism being substantially equal to zero, whilst at least one deflection coil is divided into two substantially equal coil halves, characterized in that in order to correct for tolerance angular errors in the orientation of the plane in which the electron beams are generated relative to the first direction of deflection the split deflection coil generates a magnetic quadripolar field the polar axes of which substantially coincide with the directions of deflection and the field strength of which is a substantially quadratic function of the instantaneous strength of the deflection current flowing through at least one deflection coil, and means for clamping the peak of said quadratic field.

3,906,304

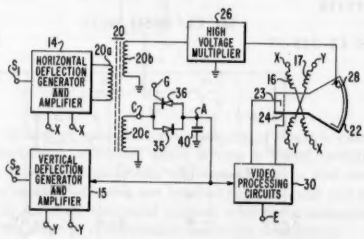
HIGH VOLTAGE PROTECTION CIRCUIT

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,323

Int. Cl.[2] H01J *29/52*

U.S. Cl. 315—379 3 Claims


HIGH VOLTAGE MULTIPLIER
HORIZONTAL DEFLECTION GENERATOR AND AMPLIFIER
VERTICAL DEFLECTION GENERATOR AND AMPLIFIER
VIDEO PROCESSING CIRCUITS

1. A high voltage protection system for rendering a display on a kinescope unviewable when the high voltage coupled to said kinescope exceeds a predetermined level, comprising:

a deflection system including a deflection winding, said deflection system being responsive to applied synchronizing waveforms for generating deflection current in said deflection winding;

means for producing a viewable display; and

voltage generating means coupled to said deflection system and to said means for producing a viewable display for generating operating voltage for said means for producing a viewable display, said voltage generating means including rectifying and switching means comprising an integrated thyristor-rectifier, a rectifier portion of which is coupled for rectifying alternating current voltage signals and for providing said operating voltage to said means for generating a viewable display and a thyristor portion of which switches into a state of conduction when said generated and rectified voltage across said integrated thyristor-rectifier exceeds said predetermined value for impairing said rectification thereby rendering said display unviewable.

3,906,305

CIRCUIT ARRANGEMENT FOR GENERATING A SAWTOOTH DEFLECTION CURRENT THROUGH A LINE DEFLECTION COIL

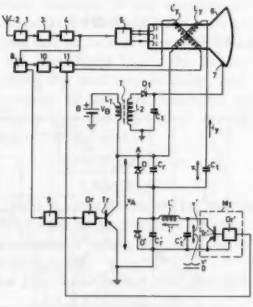
Antonius Hendrikus Hubertus Jozef Nillesen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1974, Ser. No. 435,533

Claims priority, application Netherlands, Feb. 1, 1973, 7301421

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—399 **12 Claims**



1. A circuit arrangement for generating a sawtooth deflection current having trace and retrace times through a first line deflection coil, said circuit comprising a first sawtooth network comprising a first diode adapted to be coupled to the coil, a first trace capacitance coupled to said first diode, and a first retrace capacitance coupled to said first diode, the circuit arrangement furthermore including a switching means adapted to be coupled to a voltage source and which is blocked during the retrace time, a second sawtooth network comprising a second diode, a second coil coupled to said second diode, a second trace capacitance coupled to said second coil, and a second retrace capacitance coupled to said second diode, the retrace time of the current through the second coil being approximately equal to the retrace time of the deflection current, means for coupling said sawtooth networks together and for providing that the two diodes are in series with each other and have the same conductivity direction, the series arrangement of the two diodes being coupled in parallel across the switching means, and first control element means for controlling the voltage across one of said trace capacitances.

3,906,306

ELECTRON BEAM DEFLECTION CIRCUIT INCLUDING THYRISTORS

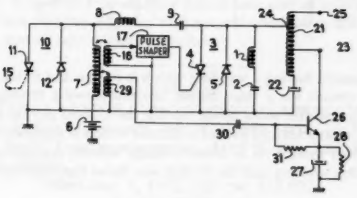
Andre Lamoureux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 20, 1973, Ser. No. 417,638

Claims priority, application France, Nov. 22, 1972, 72.41492

Int. Cl.[2] H01J *29/76*

U.S. Cl. 315—408 **5 Claims**



1. An electron beam deflection circuit for a cathode ray tube with electromagnetic deflection by means of a sawtooth current waveform having a trace portion and a retrace portion, said circuit comprising: a deflection winding; a first source of electrical energy formed by a first capacitor; first controllable switching means comprising a parallel combination of a first thyristor and a first diode connected together to conduct in opposite directions, for connecting said winding to said first source during said trace portion, while said first switching means is turned on; a second source of electrical energy including a first inductive energy storage means coupled to a voltage supply; reactive circuit means including a combination of inductive and capacitive reactances for storing the energy supplied by said second source; second controllable switching means, substantially similar to said first one, for completing a circuit including said reactive circuit means and said first switching means, when turned on before the end of said trace portion, so as to pass through said first switching means an oscillatory current in opposite direction to that which passes through said first thyristor from said first source and to turn said first thyristor off after these two currents cancel out, the oscillatory current flowing thereafter through said first diode for an interval termed the circuit turn-off time, which has to be greater than the turn-off time of said first thyristor; wherein the improvement comprises: means for drawing, during at least a part of said trace portion, a substantial amount of additional current through said first switching means, in the direction of conduction of said first diode, whereby to perceptibly shift the waveform of the current flowing through said first switching means towards the negative values by an amount equal to that of said substantial additional current and to lengthen, in proportion thereto, said circuit turn-off time, without altering the values of the reactances in the reactive circuit which intervene in the determination of both the circuit turn-off and retrace portion time intervals.

3,906,307

CIRCUIT ARRANGEMENT FOR PRODUCING A SAWTOOTH CURRENT THROUGH A LINE DEFLECTION COIL IN AN IMAGE DISPLAY APPARATUS

Johannes Simon Albert Van Hattum, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,252

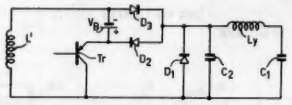
Claims priority, application Netherlands, Dec. 19, 1972, 7217254

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—408 **3 Claims**

1. Circuit arrangement for producing a sawtooth current through a line deflection coil, which coil is part of a resonance

circuit comprising also a trace capacitor and a retrace capacitor, switching means applying the voltage across the trace capacitor to the deflection coil at line frequency during the trace interval of the sawtooth current, which switching means comprise a first diode and a controlled switch connected in parallel with the said diode via a second diode, and an induc-



tive element having a winding which is connected to the resonance circuit via a third diode, current flowing through the winding and the third diode during the cut-off period of the switch, characterized in that a current which is supplied to the controlled switch by a direct-voltage source connected between the winding and the switch also flows through the winding.

3,906,308

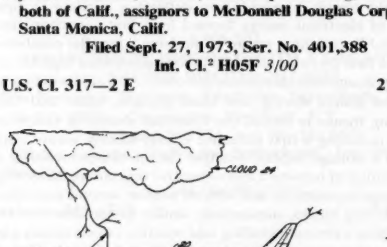
AIRCRAFT LIGHTNING PROTECTION SYSTEM

Myron P. Amason, Stanton, and Joseph T. Kung, Long Beach, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Sept. 27, 1973, Ser. No. 401,388

Int. Cl.² H05F *3/00*

U.S. Cl. 317—2 E **21 Claims**



1. In a zonal lightning protection system for aircraft and other vehicles, lightning protection means comprising:

at least one layer of dielectric material applied over an ordinarily lightning-accessible surface of an aircraft component to be protected from lightning damage,

said at least one layer being of a predetermined thickness and said dielectric material of said at least one layer being of a predetermined dielectric strength, and

overall dielectric material layer thickness and dielectric strength including said predetermined thickness and dielectric strength of said at least one layer being of such character that attachment of a lightning channel to said surface of said component is prevented.

3,906,309

OVERCURRENT SENSOR

James F. Sullivan, Stow, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 15, 1974, Ser. No. 433,595

Int. Cl.² H02H *3/08*

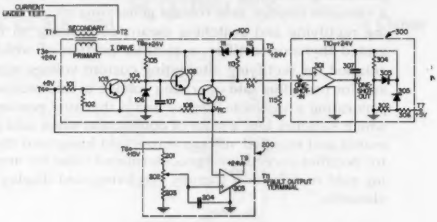
U.S. Cl. 317—18 R **16 Claims**

1. Apparatus for sensing an overcurrent in an electrical circuit comprising:

a transformer having a secondary and a primary winding with a test current from said electrical circuit being passed through said secondary winding;

drive means coupled to the primary winding of the transformer for driving a continuously increasing drive current through said primary winding;

sense means coupled to said drive means for measuring said drive current and thereby sensing whether an overcurrent condition in said secondary winding exists; and,



reset means coupled to said drive means and to said transformer for generating a signal for resetting said drive means and for providing a predetermined period of time for the core of the transformer to reset.

3,906,310

PROTECTIVE CIRCUIT FOR A MAIN TRANSISTOR IN A MONOLITHIC INTEGRATED CIRCUIT

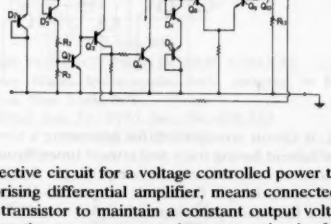
Tadashi Esashika, Hatano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 15, 1973, Ser. No. 406,188

Claims priority, application Japan, Oct. 16, 1972, 47-103384

Int. Cl.² H02H *3/10*

U.S. Cl. 317—33 VR **4 Claims**

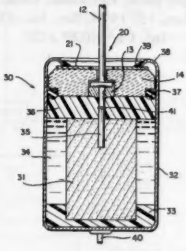


1. A protective circuit for a voltage controlled power transistor comprising differential amplifier, means connected to said power transistor to maintain a constant output voltage, overload detecting means connected to output circuit of said power transistor, means connected to said overload detecting, means for biasing said power transistor to cut-off when an overload occurs, a control transistor having a base and an emitter, temperature sensing means for detecting the temperature of the power transistor body, said temperature sensing means including a Zener diode and a forwardly bias normal diode connected in a circuit with each other, means for connecting said base and emitter to one electrode of said Zener and normal diode, respectively, and means for taking a voltage from the Zener diode-normal diode circuit to modify the bias of said control transistor and said power transistor to cut off when the temperature thereof reaches a predetermined point, the circuit of said overload detecting means and the circuit of said temperature sensing means having at least portions in common.

3,906,311
METAL-TO-GLASS-TO-CERAMIC SEAL

Lyle E. Shoot, and John Lambermont, both of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Feb. 27, 1974, Ser. No. 446,490
Int. Cl.² H01G *9/00*
U.S. Cl. 317—230 **13 Claims**

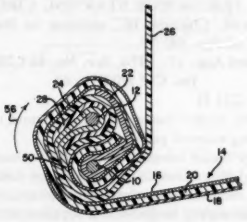


1. A seal adapted for use in an electrolytic capacitor containing liquid or semi-liquid electrolyte comprising unitary metal terminal means including elongated portion and enlarged portion, ceramic means with an aperture having at least two different diameters on the same axis, one diameter of the aperture being larger than the enlarged portion of the metal means and the other diameter of the aperture smaller than the enlarged portion of the metal means but larger than the diameter of the elongated portion of the metal means, the enlarged portion of the metal means in the one diameter of the aperture of the ceramic means, the elongated portion of the metal means in the other diameter of the aperture of the ceramic means, a metallized layer including a refractory metal and adhering to at least one surface of the ceramic means, a metallic layer over the metallized layer, the layers providing a means for attaching the seal to a housing, and glass means filling spaces between at least the enlarged portion of the metal means and the one diameter of of aperture of the ceramic means to provide the seal.

3,906,312
METALLIZED CAPACITOR WITH IMPROVED INSULATION BETWEEN LEADS

Clarence Kurt Stiefvater, Fairfax, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 3, 1974, Ser. No. 485,407
Int. Cl.² H01G *1/14*
U.S. Cl. 317—260 **2 Claims**

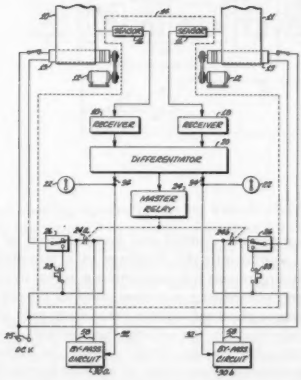


1. A wound electrical capacitor comprising a double-sided metallized dielectric film layer having first and second metallized sides, first and second lead wires which are used as winding mandrels, first and second conductive foils in contact with said first and second leads respectively, a dielectric film layer which has an end portion positioned intermediate said first conductive foil and said first side of said double-sided metallized film, said first side of said double-sided metallized film being in contact with a portion of said first conductive foil which extends beyond said end portion of said dielectric film layer, said second side of said double-sided metallized film being in contact with said second conductive foil and said dielectric film being wound around said leads for a length longer than the length of said double-sided metallized film layer so as to provide an outer insulating cover layer for said capacitor in addition to providing increased insulation between said first and second leads, and a conductive film applied to the ends of said wound capacitor to interconnect the edges of said first conductive foil at one end of said wound capacitor and the edges of said second conductive foil at the other end of said wound capacitor.

3,906,313
PLURAL MOTOR SYNCHRONIZING APPARATUS

Roger P. Danis, deceased, late of Tempe, Ariz., by Nadine M. Danis, legal representative, 4419 S. Rita Ln., Tempe, Ariz. 85282

Filed Dec. 3, 1973, Ser. No. 421,023
Int. Cl.² H02P *5/52*
U.S. Cl. 318—85 **6 Claims**



1. A system for automatically correcting an asynchronous condition between synchronously operating machines, said system comprising:

a. at least two synchronously operating machines each having its own power supply circuit;

b. a contact means in each of the power supply circuits of said machines, each of said contact means normally closed to supply power to said machines and openable to interrupt power thereto, said contact means coupled for ganged operation;

c. a by-pass circuit for each of the power supply circuits of said machines and each connected thereto in parallel with the one of said contact means therein, each of said by-pass circuits being normally open;

d. monitoring means coupled to sense the synchronous operation of said machines and for opening said contact means of each of the power supply circuits upon the occurrence of an asynchronous condition, and for simultaneously producing an output signal indicative of one of said machines lagging and applying that output signal to the particular one of said by-pass circuits which is connected to the power supply circuit of the lagging one of said machines, said monitoring means adapted to return said contact means to their normally closed state when synchronous operation of said machines is restored; and

e. means within each of said by-pass circuits for responding to the output signal from said monitoring means by closing said by-pass circuit to supply power to the lagging

one of said machines until a synchronous operating condition is restored.

3,906,314

DEVICE FOR REGULATING AND SWITCHING CURRENTS FROM A CONSTANT D.C. SOURCE INTO THE WINDINGS OF AN A.C. MACHINE

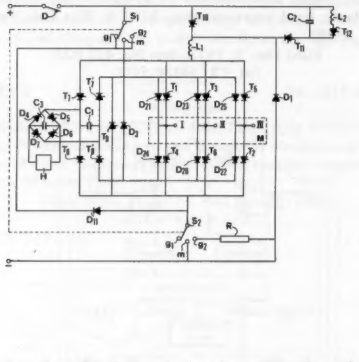
Albert Wiart, Sannois, France, assignor to Jeumont-Schneider, Paris, France

Filed Jan. 18, 1974, Ser. No. 434,692

Claims priority, application France, Jan. 24, 1973, 73.02373

Int. Cl.[2] H02K *29/00*

U.S. Cl. 318—138 **2 Claims**



1. A system for the control and commutation of current from a D.C. source into the windings of a polyphase A.C. machine including means for connection in series to terminals of a D.C. source comprising, a current chopper providing D.C. currents having a given adjustable value from said source; a smoothing inductor for smoothing the currents from said chopper; a thyristor routing bridge having $2n$ arms with n mid-points respectively connected to n phase terminals of the A.C. machine, the ends of each of two groups being respectively connected to the smoothing inductor output and a negative terminal of the source, the bridge being configured and controllable so that the adjustable D.C. current supplied by the chopper and smoothing inductor is cyclically routed to windings of the n phases of the A.C. machine; a diode commutating bridge having $2n$ arms, with n mid-points respectively connected to the n phase terminals of the A.C. machine; a circuit for de-energizing the thyristors of the routing bridge; a switching circuit for progressively transferring the current from the commutating bridge to the routing bridge; the ends of each of the two groups of said commutating bridge being connected to said circuit for de-energizing the thyristors of the routing bridge and to said switching circuit for progressively transferring the current from the commutating bridge to the routing bridge; said circuit for de-energizing the thyristors comprising two subcircuits for each de-energizing a group of thyristors of the routing bridge connected between a unit and the corresponding group of the commutating bridge; a capacitor connected in common with said two sub-circuits; said switching circuit comprising a circuit for each group of diodes of the commutating bridge connected between a terminal of the source and the commutating bridge; selectors for isolating certain of said circuits and an auxiliary switching circuit for generator and braking operation of the machine; an auxiliary switching circuit connected to the terminals of said capacitor common to the two sub-circuits for de-energizing the thyristors of the routing bridge, and comprising a diode bridge having a diagonal including a capacitor and an auxiliary chopper shunting said capacitor for maintaining a constant voltage at the terminals of the second-mentioned capacitor.

3,906,315

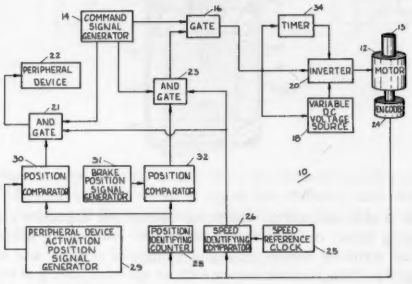
CLOSED-LOOP, PRECISION-STOP INDUCTION MOTOR CONTROL CIRCUIT

Theodore H. Gotisar, El Dorado Hills, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Jan. 15, 1974, Ser. No. 433,460

Int. Cl.[2] H02P *3/20*

U.S. Cl. 318—212 **8 Claims**



1. A precision-stop control circuit for controlling an electric induction motor having a movable output member, said circuit comprising:

means for providing a cyclic drive signal to the induction motor, the frequency of said drive signal at least partially determining the rate of motion of said motor output member;

means for initiating braking by reducing the frequency of said drive signal to thereby reduce the operating speed of the induction motor to a predetermined non-zero value; feedback control means for identifying the speed and position of the movable motor output member; and

means responsive to the feedback control means for stopping the induction motor by converting said cyclic drive signal to a DC signal when the movable member slows to a predetermined speed and reaches a predetermined position, the predetermined speed and position of said movable output member upon application of the DC signal causing said member to move a predetermined distance after application of said DC signal and stop precisely at a predetermined position.

3,906,316

ELECTRIC MOTOR STARTING CIRCUIT

Joseph T. Zurad, Chicago, Ill., assignor to Bodine Electric Company, Chicago, Ill.

Filed Apr. 17, 1974, Ser. No. 461,284

Int. Cl.[2] H02P *1/44*

U.S. Cl. 318—221 D **2 Claims**

1. An electric motor stator operating circuit comprising;

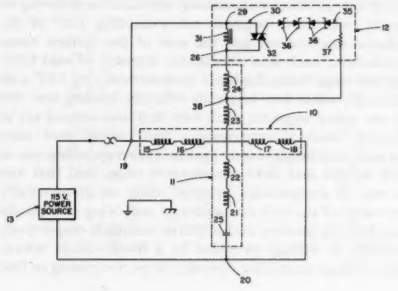
an alternating current power supply;

a first motor stator winding inductance connected to said power supply to provide a main motor running winding; a second motor stator winding inductance connected to said power supply to provide a supplemental motor running winding;

a capacitor connected in series with said second winding inductance to shift the phase thereof with respect to said first winding inductance for providing a permanent-split phase capacitor motor;

an inductance choke connected in series with said second winding inductance and said capacitor to decrease the reactance thereof for increasing the starting torque provided by said second winding inductance;

a triac connected in parallel with said choke and being actuable to short-circuit said choke to eliminate the effect thereof in said circuit; and



a gating circuit connected in parallel with said triac and being adapted to be conductive only above a given voltage for triggering on said triac, said gating circuit including a pair of bi-directional zener diodes connected between a gate of said triac and a portion of said supplemental winding.

3,906,317

CONTROL FOR DC SERIES-WOUND MOTOR

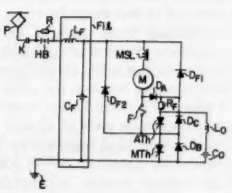
Hiroshi Narita, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 300,889, Oct. 26, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,400

Claims priority, application Japan, Oct. 29, 1971, 46-85511; Oct. 29, 1971, 46-85512

Int. Cl. H02k *23/08*

U.S. Cl. 318—246 **15 Claims**



1. An apparatus for controlling a DC series-wound motor comprising DC power supply means coupled to said DC series-wound motor for supplying power thereto, a first thyristor connected in series with the armature and field coil of said DC series-wound motor, a second thyristor connected in parallel with said field coil of said DC series-wound motor and connected in series with said first thyristor in the same direction for commutating said first thyristor, commutator means for applying a voltage to said first and second thyristors and for turning off both thyristors when both of said thyristors are rendered conductive, the polarity of said voltage being reverse to the polarity of said thyristors, and control means for applying a phase controlled firing signal to both of said thyristors.

3,906,318

DEVICE FOR PROVIDING A CONTROLLED RETARDATION OF A WINDING MACHINE

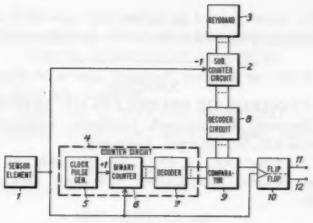
Leif Roland Kjellberg, Stockholm; Kjell Riise, Huddinge, and Per-Olov Svensson, Ekero, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Feb. 11, 1974, Ser. No. 441,639

Claims priority, application Sweden, Feb. 26, 1973, 7302676

Int. Cl.[2] G05B *19/30*

U.S. Cl. 318—269 **4 Claims**



1. In a winding apparatus having a shaft which is driven by a motor and retarded by a brake, apparatus for controlling the retardation of the rotation of the shaft which is brought to a stop after a predetermined number of winding turns, said apparatus comprising sensor means for generating pulses in dependence on the rotation of the shaft, a first pulse counter means presettable to a desired count number related to the desired number of winding turns and connected to said sensor means for decrementing the preset count number in response to pulses received from said sensor means, first decoder means connected to said first pulse counter means for converting the instantaneous count member in said first counter means to a first digital number representing a desired shaft rotation velocity for the instantaneous count number in accordance with a function which generally decreases linearly from a given count number to stop count number, digital velocity representing means connected to said sensor for generating a second digital number representing the actual instantaneous shaft rotation velocity, a digit comparator means for comparing said first and second digital numbers, and a relaying means connected to said digital comparator means for activating the motor only if the second digital number representing the actual shaft rotation velocity is less than the first digital number representing the then desired shaft rotation velocity and for activating the brake only if said second digital number is greater than said first digital number.

3,906,319

UNIVERSAL MOTOR SPEED CONTROL SYSTEM

Lee J. Milligan, 14 Cheri Ln., Fairfield, N.J. 07006

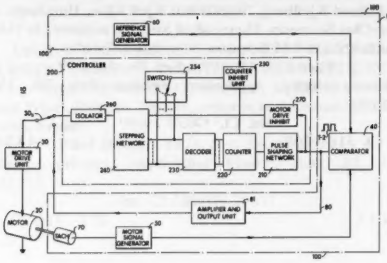
Filed Oct. 4, 1973, Ser. No. 403,645

Int. Cl. H02p *5/06*

U.S. Cl. 318—318 **10 Claims**

1. A system for controlling the speed of a motor, comprising means for generating an error signal indicative of a departure of the motor from a specified speed condition, and means

responsive to the error signal for producing a plurality of increasing discrete and different drive levels during the time



when the motor speed is below said specified speed, and means for applying said drive levels to said motor.

3,906,320

CONTROL OF BRUSHLESS D-C MOTORS

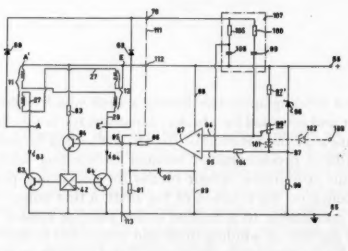
Benno Doemen, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Oct. 23, 1973, Ser. No. 408,781

Claims priority, application Germany, Oct. 27, 1972, 2252728

Int. Cl. H02p *5/06*

U.S. Cl. 318—331 **19 Claims**



1. Method of controlling the operation of brushless d-c motors having a rotor (**26**), winding means (**11, 12**) being pulse-energized to generate torque pulses, and means (**45, 46**) to store magnetic energy during generation of torque and to release the stored energy during gaps between torque pulses to provide substantially uniform torque to the rotor during rotation thereof;

comprising the steps of

deriving a signal (U_{70}) representative of voltage induced in the motor winding means;

separating said signal into its a-c and its d-c components;

displacing the a-c component to derive a displaced signal (**103**) having absolute maxima and minima values which are displaced with respect to the absolute maxima and minima of said a-c component;

controlling the timing of energization of said motor winding means, with respect to angular rotor position, in dependence on said displaced a-c component;

and controlling the intensity of energization of said winding means in accordance with the d-c component.

3,906,321

DIRECT CURRENT MOTORS

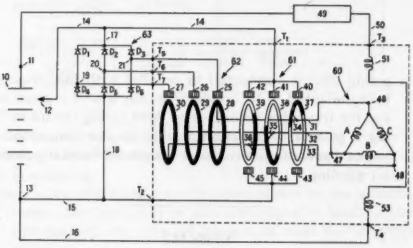
Jalal Tawfiq Salihi, 20 Kahdena Rd., Morristown, N.J. 07960

Filed Oct. 15, 1973, Ser. No. 406,677

Int. Cl. H02k *13/00*

U.S. Cl. 318—439 **5 Claims**

1. A separately excited two pole direct current motor system comprising, stationary field windings with first and second terminals, rotating armature, armature windings, commutators and associated stationary brushes, slip rings and associated stationary brushes, a full wave bridge rectifier, said armature windings comprising a three phase winding with first second and third terminals, said commutators comprising first second and third commutator rings and associated first and second sets of stationary commutator brushes, said three commutator rings being mechanically identical each having an electrically conductive segment not exceeding 120° of the commutator ring surface and the rest of the surface being non-conductive, each said conductive segment of said three commutator rings being displaced symmetrically by 120° with respect to the other two segments whereby leading one and lagging the other segment, each said first and second set of commutator brushes comprising a first second and third brushes each said brush resting against a corresponding one of said first second and third commutator rings, said first and second sets of commutator brushes being on diametrically opposite sides of the said commutators and being electrically connected to the positive and negative terminals respectively of a variable dc voltage provided by a fixed voltage source through a voltage controller, said slip rings comprising of first



second and third electrically conductive rings and associated first second and third stationary slip ring brushes resting against the corresponding rings, said first second and third end terminals of said armature winding connected respectively to said first second and third commutator segments such that each said winding terminal is electrically conductive with a conducting segment of one of the corresponding said commutator rings, also said first second and third end terminal of said armature winding connected respectively to said first second and third slip rings such that each winding terminal is electrically conductive with one of said three slip rings, said full wave bridge rectifier comprising three pairs of first and second diodes, the anode-cathode junction of each pair of said three pairs of first and second diodes being electrically connected to one of the said three slip ring brushes, the cathode ends of all said three pairs of first and second diodes connected together by a first conductor, the anode ends of all said three pairs of first and second diode connected together by a second conductor, said first conductor connected to the positive terminal of said variable dc voltage source, said second conductor connected to the negative terminal of said variable dc voltage source, said stationary field winding energized separately from said dc voltage source through a field controller.

3,906,322

SHAFT ROTATION RESPONSIVE STOPPING MEANS FOR A MOTOR-DRIVEN CHUCK

Kenichi Hirao, Kawasaki, Japan, assignor to Fuji Electric Company Ltd., Kawasaki, Japan

Filed Mar. 14, 1974, Ser. No. 451,268

Claims priority, application Japan, Mar. 14, 1973, 48-31580

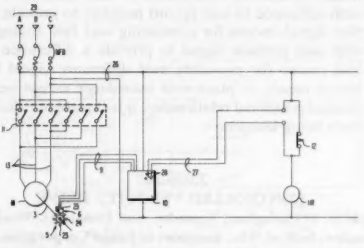
Int. Cl.² H02H *7/08*

U.S. Cl. 318—464 **3 Claims**

1. In an alternating current motor driven chuck including a chuck for mechanically clamping a machine tool to a main

shaft, and electric motor with a rotatable shaft coupled to said chuck for driving said chuck, a source of alternating electrical current, the improvement comprising:

an electrical pulse generator operatively arranged relative to said motor shaft and responsive to shaft rotation for providing electrical pulses having a frequency proportional to shaft rotation speed, and

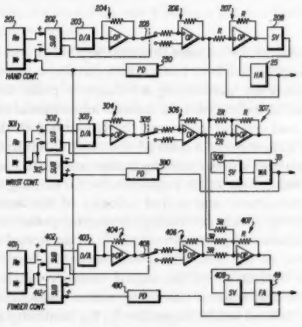


relay means responsive to coincidence between the frequencies of said source and the output of said generator for controlling energization of said motor by said source; whereby, reduction in the speed of rotation of said motor shaft as said chuck clamps said tool, and reduction of pulse generator frequency below a preset value causes said relay means to instantaneously disconnect said motor from said electrical source.

3,906,323
INDUSTRIAL ROBOT

Takehiko Ono, and Nobuo Taguchi, both of Fuchu, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 25, 1974, Ser. No. 436,746
Claims priority, application Japan, Jan. 25, 1973, 48-9884
Int. Cl.[2] G05B *9/02*
U.S. Cl. 318—563 **10 Claims**



1. An industrial robot having a plurality of moving members;

a plurality of independent actuator means;

mechanical means forming a force imparting linkage which is primarily intended for driving each member by an associated independent actuator means and is actually interrelated such that operation of at least one of the independent actuator means brings about the intended movement of the moving member associated therewith and an undesirable movement of one of the other moving members;

control means for controlling the movement of moving members in response to a plurality of command signals respectively;

wherein said control means comprises:

a plurality of error signal generating means each generating an error signal indicative of the difference between the actual position and desired position represented by said command signal of its associated moving member;

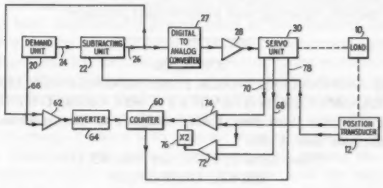
a plurality of manipulating signal generating means each generating a manipulating signal in response to its associated error signal at the least for controlling its associated independent actuator;

means for supplying the error signal of the moving member, operation of whose associated independent actuator means causes the undesirable movement of one of the other moving members, to the manipulating signal generating means associated with the moving member subjected to the last mentioned undesirable movement in the sense to cancel the undesirable movement thereof.

3,906,324
POSITIONAL SERVO SYSTEM HAVING THREE PHASE SPEED, NUMERICAL CONTROL

Ian W. Smith, Warwick, England, assignor to Alfred Herbert Limited, Edgwick, England

Filed May 3, 1973, Ser. No. 356,841
Claims priority, application United Kingdom, May 6, 1972, 21274/72
Int. Cl. G05b *13/00*
U.S. Cl. 318—567 **7 Claims**



1. In a closed loop machine tool control system incorporating a digital computer for producing a demand signal indicating a desired machine tool control setting, transducing means responsive to the machine tool to produce a feedback signal indicative of the actual machine tool setting, comparing means controlled by the digital computer for comparing the demand and feedback signals to produce an error signal dependent on the difference therebetween, and servo means connected to the machine tool and responsive to the error signal to adjust the machine tool setting in a direction tending to reduce the error signal to zero, the improvement wherein the digital computer functions under control of a micro-program.

3,906,325
ADAPTIVE FEELING APPARATUS FOR DETERMINING A PREARRANGED POSITION IN WHICH A PART IS TO BE FITTED

Marion Salmon, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Dec. 20, 1973, Ser. No. 426,482
Int. Cl.[2] G05B *19/18*
U.S. Cl. 318—569 **14 Claims**

1. Adaptive feeling apparatus for determining a prearranged position on a surface of a structure, comprising:

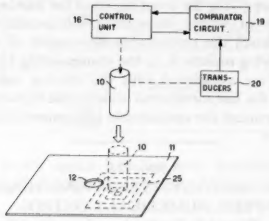
at least one element movable in accordance with a predetermined path recorded on an information support for sensing the surface of the structure,

control means for controlling the movement of said element for advancing said movable element in a first stage to contact said surface to determine the plane in which said prearranged position is located, and for advancing said movable element in a second stage in said plane in a

predetermined search movement to determine said prearranged position, the contact of said element with said surface producing a variable force on said element,

means for detecting said force, and

means responsive to said detecting means for causing said control means to shift from said first stage to said second stage upon a first modification of said force applied to said element to at least a first predetermined value, said



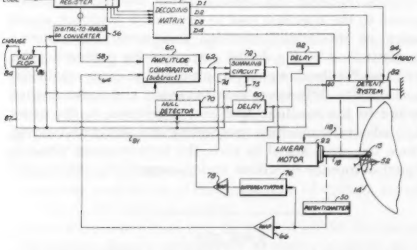
causing means comprising comparison means for comparing said variable force with a first comparison force comprising said first predetermined value during said first stage and with a second predetermined value during said second stage, said second stage movement being terminated upon a second modification of said force applied to said element to at least said second predetermined value thereby defining said prearranged position.

3,906,326

FINE AND COARSE TRACK POSITIONING SYSTEM FOR A TRANSDUCER IN A MAGNETIC RECORDING SYSTEM

Sung Pal Chur, San Jose, Calif., assignor to Caelus Memories Inc., San Jose, Calif.

Filed June 3, 1970, Ser. No. 43,116
Int. Cl.[2] G05B *11/18*
U.S. Cl. 318—594 **10 Claims**



1. A positioning system for placing a magnetic transducer means in a predetermined positional relationship with a magnetic record member in accordance with a numerical value comprising:

motor means for motivating said transducer means relative to a record member;

coarse positioning means including means for providing a first analog signal related to a significant portion of said numerical value, to actuate said motor means so as to place said transducer means near said desired positional relationship; and position control means responsive to a selected least significant portion of said numerical value for sensing the position of said transducer means to provide a second analog signal after said element means has been positioned near said desired positional relationship to finally actuate said motor means to place said transducer at said predetermined positional relationship with said magnetic record member in accordance with said numerical value,

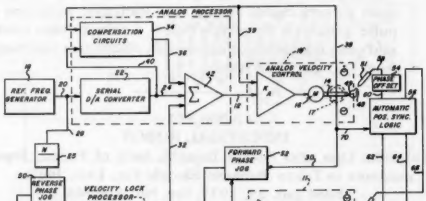
wherein said means for providing a first analog signal includes input means for receiving said numerical value as a binary code of n bits, and wherein said coarse positioning means is responsive to (n—y) of the most significant of said n bits to provide said first analog signal, said coarse positioning means includes means for sensing the instant positional relationship of said transducer means with reference to said record member to provide a position signal; means for comparing said first analog signal with said position signal to provide a difference signal; and means for providing said difference signal to said motor means to place said transducer means near said desired positional relationship, n being greater than y and both being integers.

3,906,327

CONTROLLED VELOCITY DRIVE

Gerald F. O'Callaghan, Kenosha, and Donald D. Woelz, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 28, 1973, Ser. No. 392,406
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **62 Claims**



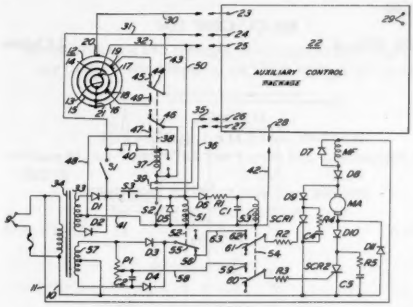
1. A control for at least first and second drives which drive first and second driven loads, respectively, comprising generating means for generating a reference pulse train wherein each pulse is indicative of a desired incremental movement of the first and second loads and the frequency of the reference pulses is indicative of a desired velocity of the first and second loads, first and second sensing means associated with said first and second driven loads, respectively, for sensing actual incremental movement and actual velocity of the associated load and each of which establishes a second pulse train wherein each incremental pulse is indicative of an actual incremental movement of the associated load and the frequency of the pulses is indicative of the actual velocity of the associated load, first and second summing means associated with said first and second loads, respectively, for summing pulses of the reference pulse train and pulses of the associated second pulse train for generating a position error signal indicative of the positional error between the actual incremental position of the associated laod, first and second velocity control means associated with said first and second loads, respectively, and each of which is responsive to the associated error signal for varying the velocity of the associated load to drive the associated loads substantially at the desired velocity, third and fourth sensing means associated with said first and second loads, respectively, for sensing an actual postion of the associated load and establishing third and fourth signals, respectively, indicative of the actual position of the associated load, and synchronizing means responsive to said third and fourth signals for determining the actual position of one of the associated loads relative to the actual position of another of the associated loads.

3,906,328

AUTOMATIC POSITIONING MECHANISM

Carl M. Wenrich, Shillington, and Bryce E. Hoverter, Jr., Reinholds, both of Pa., assignors to Teledyne Mid-America Corporation, Los Angeles, Calif.

Filed Nov. 29, 1973, Ser. No. 420,167
Int. Cl.[2] G05B 5/01
U.S. Cl. 318—612 8 Claims



1. An automatic positioning mechanism for use in conjunction with a work utility having first and second relatively movable members so related that particular positions of said first member always correspond to particular positions of said second member, the combination comprising,

a. sensing means associated with said first member for sensing at least one predetermined position thereof when so associated,

b. drive means couplable to said first member for driving the same to said at least one predetermined position including a direct current motor having a field winding and an armature winding,

c. motor energizing means including means for coupling said motor windings to a source of AC power, and a first gated rectifier having its anode-cathode current flow path in series electrical circuit with said motor armature and having a gate electrode,

d. motor braking means including a second gated rectifier having its anode-cathode current flow path in parallel electrical circuit with said motor armature and having a gate electrode,

e. first control means coupled to said sensing means effective responsive to a first sensed condition of said sensing means indicative that said first member is not at said predetermined position to couple said gate electrode of said first gated rectifier to a source of AC power to turn on said rectifier and cause running current to flow through said motor to cause said motor to drive said first member to the said sensible predetermined position whenever said first sensed condition of said sensing means exists,

f. second control means coupled to said sensing means effective responsive to a second sensed condition of said sensing means indicative that said first member is at said predetermined position to couple said gate electrode of said second gated rectifier to a gating voltage to turn on said rectifier and cause a short-circuit reverse current flow through said armature winding to dynamically brake said motor for at least a part of the time during which said second sensed condition of said sensing means exists,

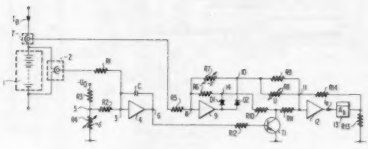
whereby, said first membr is alternately driven and braked by said drive means until stopped at said predetermined position.

3,906,329

METHOD OF MEASURING THE CHARGE CONDITION OF GALVANIC ENERGY SOURCES AND APPARATUS FOR CARRYING OUT THIS METHOD

Christian Bader, Stuttgart, Germany, assignor to Firma Deutsche Automobilgesellschaft mbH, Germany

Filed Aug. 27, 1973, Ser. No. 391,774
Claims priority, application Germany, Aug. 30, 1972, 2242510; Mar. 9, 1973, 2311758
Int. Cl.[2] H02J 7/00; H01M 10/38
U.S. Cl. 320—44 24 Claims



1. A method for measuring the charge condition of galvanic energy sources by means of an integrating measuring device, comprising the steps of sensing the charging and discharging current providing a signal therefrom having a magnitude at least substantially proportional to the charging current and a signal having a magnitude at least substantially proportional to the discharge current, weighting the signal magnitude which is at least substantially proportional to the charging current with a charge factor dependent on the predetermined gassing voltage, which is variable with temperature, and matched in its timely behavior to the charge condition of the energy source before feeding it to the integrating measuring device, multiplying the signal magnitude at least substantially proportional to the discharge current with a factor dependent on the respective battery temperature and subsequently raising the thus multiplied signal magnitude to a power with an exponent formed by a sum of terms, whose one term itself is variable dependent on the battery temperature, before it is in turn fed to the integrating measuring device, weighting the signal magnitude at least substantially proportional to the charging current with a factor dependent on the respective battery temperature and dependent on the charge condition before it is fed to the integrating measuring device, and feeding the signal magnitude at least substantially proportional to the charging current reduced by the proportion of the gassing current which is dependent on the difference between the battery terminal voltage and the gassing voltage, as well as a signal magnitude proportional to the average value of the discharge current raised to the power having said exponent to the integrating measuring device.

3,906,330

OPERATION OF MULTICELL TRACTION BATTERIES

Klaus Salamon, Kelkheim; Heinrich Busch, Wesel, and Eberhard Zander, Kirchhellen, all of Germany, assignors to Varta Batterie A.G., Hannover, Germany

Filed Oct. 1, 1974, Ser. No. 510,989
Claims priority, application Germany, Oct. 8, 1973, 2350353
Int. Cl.[2] H01M 2/12
U.S. Cl. 320—46 10 Claims

1. A method of operating multi-cell storage batteries for battery operated vehicles, said method comprising:

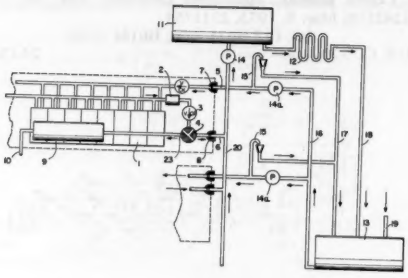
carrying out only partial battery charging or charging to at most a charge factor of 1 while the batteries are in the vehicles; and

carrying out full and compensating charging while the batteries are in charging stations outside the vehicle,

the comparatively small gas quantities evolved during charging and discharging in the vehicle being rendered

harmless in a small recombination reactor associated with the vehicle or the battery, and

the comparatively large quantities of charging gas evolved during full charging being recombined into water in a central recombination reactor permanently installed at the charging station,



the central recombination reactor being supplied with the charging gases from the storage battery via a gas manifold, and

the recombined water being returned to the central battery water refill arrangement.

3,906,331

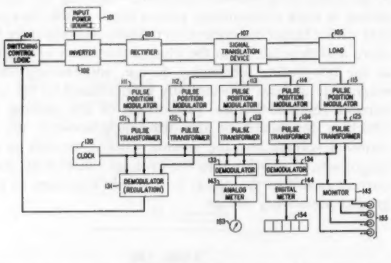
DC TO DC CONVERTER WITH LINEAR PULSE PROCESSING CIRCUITRY

Billy Harold Hamilton, Summit; Frederick Francis Kunzinger, Parsippany, and Frank Carl La Porta, Millington, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1974, Ser. No. 474,714

Int. Cl. H02m *3/32*

U.S. Cl. 321—2 **12 Claims**



1. A modulator circuit for application in signal sensing arrangements comprising, means to accept analog signals, means to accept a reference signal, a differential amplifier including a first input connected to said means to accept analog signals and a second input connected to said means to accept a reference signal, a sawtooth wave generator including means to accept a synchronizing signal, a comparator including a first input connected to the output of said differential amplifier and a second input connected to the output of said sawtooth wave generator, and a feedback circuit coupling the output of said comparator to said first input connected to said means to accept analog signals and including a constant current source, a switch having a main conduction path coupled to said constant current source and connected to control the application of current by said constant current source to said first input connected to said means to accept analog signals, and means to control said switch responsive to the output of said comparator whereby the current of the current source is balanced against the current input of said means to accept analog signals so that the output of said modulator circuit is insensitive to changes in frequency of the synchronizing signal.

3,906,332

INTEGRATED CIRCUIT CURRENT SUPPLY

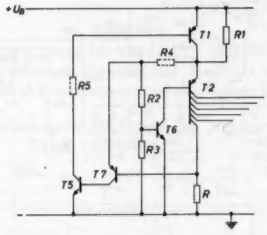
Hans Keller, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,972

Claims priority, application Germany, Nov. 18, 1972, 2256640

Int. Cl.² G05F *1/56*

U.S. Cl. 323—4 **2 Claims**



1. A current supply circuit for a monolithic integrated circuit containing a plurality of transistor stages comprising:

a source of supply voltage having first and second terminals;

a current supply transistor having an emitter coupled to said source of supply voltage and having a base and a collector;

a multicollector current distribution transistor having an emitter coupled to the collector of said current supply transistor and having a base;

a first resistor coupled between one collector of said multicollector current distribution transistor and the zero point of the circuit;

an ohmic voltage divider coupled between the collector of said current supply transistor and the zero point of the circuit;

a further transistor having a base coupled to the tapping point of said ohmic voltage divider, wherein the base of said current distribution transistor is coupled to the zero point of the circuit via the collector-emitter path of said further transistor; and

a regulating amplifier having an output coupled to the base of said current supply transistor and having first and second inputs, said first and second inputs coupled across said resistor for extracting a reference voltage, said regulating amplifier maintaining the current flowing in said one collector constant.

3,906,333

LOW COST SWITCHING HIGH VOLTAGE SUPPLY

Michael H. Kalmanash, Bethel, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 30, 1974, Ser. No. 510,258

Int. Cl.² G05F *1/26*

U.S. Cl. 323—17 **2 Claims**

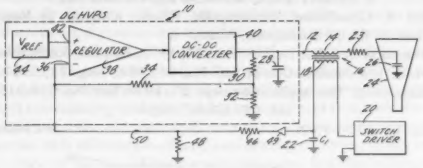
1. A switching high voltage supply comprising:

a high voltage DC power supply having a control input;

a high voltage step-up transformer, said transformer having a primary winding and having a secondary winding connected in series between the output of said high voltage power supply and a load;

a capacitor connected in series with the primary of said transformer;

a switch driver for driving the series combination of said transformer primary and said capacitor; and



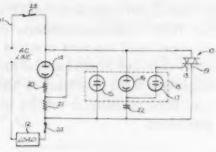
means coupling DC voltages developed across said capacitor to the control input of said high voltage power supply.

3,906,334

THYRISTOR LATCHING SWITCH

William M. Au-Yang, 6762 Los Verdes Dr., Los Angeles, Calif. 90274

Filed Nov. 24, 1972, Ser. No. 309,605
Int. Cl.[2] G05F *1/44*; **H03K** *3/42*
U.S. Cl. 323—21 **6 Claims**



1. An AC circuit control element comprising:
a. a thyristor;
b. a light sensitive voltage divider across the power terminals of said thyristor; and,
c. a first lamp connected between said voltage divider and the gate lead of said thyristor, said first lamp being arranged to illuminate the light sensitive element of said voltage divider, whereby when the light sensitive element of said voltage divider is illuminated, the output of said voltage divider will cause said first lamp to emit light so as to maintain illumination on said light sensitive element, the output from said voltage divider also causing said thyristor to trigger.

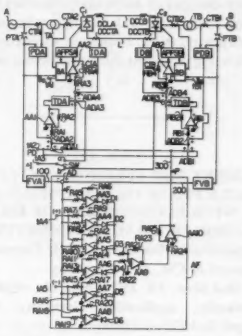
3,906,335

FREQUENCY REGULATING DEVICE FOR A.C. SYSTEMS INTERCONNECTED THROUGH D.C. SYSTEMS

Atsumi Watanabe; Hisao Amano, and Akira Isono, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 11, 1974, Ser. No. 450,187
Claims priority, application Japan, Mar. 12, 1973, 48-28015
Int. Cl.[2] H02J *3/36*
U.S. Cl. 321—2 **4 Claims**

1. A control system for a system interconnection consisting of two a.c. systems interconnected by a d.c. power transmission system, comprising a rectifier and an inverter in said d.c. power transmission system, means including at least constant current control means associated with said rectifier for controlling the current in said d.c. power transmission system to a constant value, and means for modifying the set point of said constant current control means depending on the frequency difference between the two a.c. systems so that the set point of said constant current control means can be greatly modified with the increase in the frequency difference, said means for modifying including first means for detecting the frequencies of the respective a.c. systems to convert the same into corresponding voltage signals, second means for seeking the difference between the frequencies of the two a.c. systems on the basis of the voltage signal outputs of said first means, third means for amplifying the output of said third means representing the frequency difference, and fourth means connected to said third means for delivering a signal for modifying the



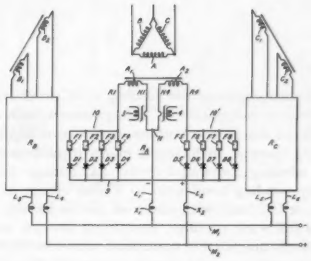
current setting of the d.c. power transmission system, said third means having a non-linear characteristic so that the rate of increase or decrease in the power being tramsmitted through the d.c. power transmission system can be greatly increased with the increase in the frequency difference.

3,906,336

SEMICONDUCTOR VALVE ASSEMBLY AND BUS ARRANGEMENT FOR HIGH CURRENT LOW VOLTAGE ELECTRIC POWER CONVERTER

Robert P. De Puy, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed July 22, 1974, Ser. No. 490,459
Int. Cl.[2] H02M *7/00*
U.S. Cl. 321—8 R **11 Claims**



1. In electric current converter apparatus, a power transformer including an enclosure and having a pair of alternating current phase winding terminals and an intermediate neutral terminal mounted upon said enclosure, a coaxial assembly of at least three tubular electrical conductors having one axial end adjacent said transformer terminals and the other end remote, means electrically connecting said phase winding terminals to a first and a second of said tubular conductors, respectively, at the transformer end of said coaxial assembly, a direct current terminal connected to a third said tubular conductor at said transformer end of said coaxial assembly, a plurality of semiconductor devices each having anode and cathode electrodes, means mounting said semiconductor devices in two angularly balanced valve arrays circumferentially about the axis of said coaxial assembly at the remote end thereof, common valve terminal means connecting like electrodes of all said semiconductor devices directly to said third

tubular conductor at its remote end, and means connecting the other electrodes of each said valve array, respectively, directly to the remote ends of said first and second tubular conductors, whereby phase winding currents through said coaxial assembly are divided substantially equally among the semiconductor devices of each said valve array and unidirectional current from said valves traverses said assembly in directly reentrant relation, both said direct current and neutral terminals being adjacent the transformer end of said coaxial assembly.

3,906,337

ARRANGEMENT FOR FEEDING A DC LOAD CIRCUIT FROM SINGLE PHASE OR POLYPHASE AC VOLTAGE MAINS WITH ECONOMIZING OF IDLE POWER CONSUMPTION OF LOAD ALTERNATING CURRENT

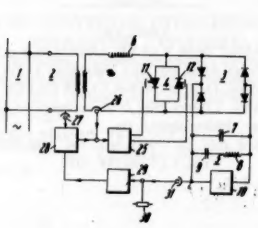
Manfred Depenbrock, Bochum-Stiepel, Germany, assignor to Brown, Boveri & Cie, AG, Germany

Filed Mar. 13, 1974, Ser. No. 450,795

Claims priority, application Germany, Apr. 5, 1973, 2317068; Apr. 5, 1973, 2317067

Int. Cl.² H02M 7/17; G05F 1/68

U.S. Cl. 321—10 **26 Claims**



1. In an arrangement for feeding a DC load circuit from single phase or polyphase AC voltage mains, with economizing of idle, or reactive or wattless, power consumption of load alternating current, including a mains transformer having a primary winding connected to the AC voltage mains and a secondary winding connected to a load circuit in turn connected to a DC load, with said load circuit having connected therein a full wave rectifier, smoothing devices, and at least one positively quenchable controlled semi-conductor rectifier with a respective control device connected thereto: the improvement comprising, in combination, said smoothing devices including at least one condenser connected across said load circuit, at least one choke connected in series in said load circuit, and at least one filter connected in said load circuit between said rectifier and said DC load, said filter being tuned to double the frequency of said AC voltage mains; positively quenchable controlled semiconductor rectifier means controlling the magnitude of one current, of the alternating current and direct current, available on the secondary side of said mains transformer in the form of current or voltage; and a control device connected to and controlling said controlled rectifier means by pulse width modulation thereof, to maintain the time slope of the power in the load circuit substantially in phase with the slope of the power, fluctuating with twice the mains frequency about the constant-per-unit-of-time mean load power, of the load alternating current which is in phase with the mains AC voltage.

3,906,338

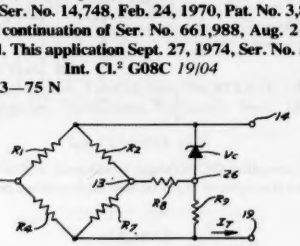
TWO WIRE CURRENT TRANSMITTER RESPONSIVE TO A RESISTANCE SENSOR INPUT SIGNAL

Earl A. Grindheim, Minneapolis, Minn., assignor to Rosemount Inc., Minneapolis, Minn.

Division of Ser. No. 14,748, Feb. 24, 1970, Pat. No. 3,859,594, which is a continuation of Ser. No. 661,988, Aug. 21, 1967, abandoned. This application Sept. 27, 1974, Ser. No. 510,015

Int. Cl.² G08C 19/04

U.S. Cl. 323—75 N **9 Claims**



2. In a current transmitter having a current control circuit, a resistance bridge network comprising first, second, third and fourth resistance means connected in a closed series loop to provide first and second excitation junctions and first and second output signal junctions, a voltage reference element and fifth resistance means connected in series between said first and second excitation junctions, said voltage reference element and said fifth resistance means providing a third junction therebetween, said current control circuit including means responsive to voltages at said signal junctions to control the current through the third junction to thereby change the voltage across said fifth resistance means and the voltage to said excitation junctions.

3,906,339

APPARATUS FOR DETERMINING THE ANGLE BETWEEN A ROTATABLE BODY AND A FIXED COIL SYSTEM, HAVING USE IN A COMPASS SYSTEM

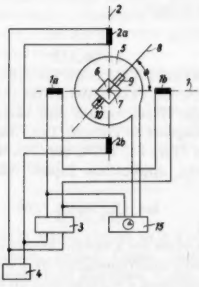
Reinhard Leisterer, Bremen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 31, 1974, Ser. No. 493,625

Claims priority, application Germany, Aug. 20, 1973, 2341984

Int. Cl.² G01R 33/00; G01B 7/30; G01C 17/04

U.S. Cl. 324—34 PS **10 Claims**



1. In a device for deriving an electrical representation of a spatial angle, the device including a coil system composed of two coils arranged with their coil axes perpendicular to one another, a voltage source connected to apply to each coil a respective one of two alternating voltages of the same frequency and amplitude but shifted in phase with respect to one another by 90° for causing the two coils to produce a rotating magnetic field, and a positioning member mounted in the alternating magnetic field produced by the coil system to be rotatable about an axis of rotation perpendicular to the coil

axes of the coil system, the spatial angle to be detected lying between a reference axis fixed relative to the positioning member and extending perpendicular to the axis of rotation thereof and one of the two coil axes, the improvement wherein: said positioning member comprises an elongate rod of high magnetic permeability material oriented with its longitudinal axis extending obliquely to the axis of rotation of said positioning member; and said device further comprises a third coil surrounding said positioning member and fixed relative to said two coils, said third coil oriented with its coil axis parallel to the axis of rotation of said positioning member; whereby a portion of the flux of the rotating magnetic field flows longitudinally through said rod to traverse the plane of said third coil, in a direction transverse to that plane, and induces, in said third coil, a voltage which differs in phase from the voltage applied to one of said two coils by an amount corresponding to the angle between the axis of that one of said two coils and the projection on the plane of said third coil of the longitudinal axis of said rod.

3,906,340

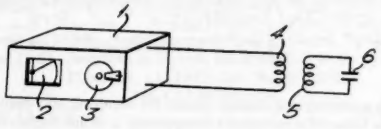
TUNED CIRCUIT MONITOR FOR STRUCTURAL MATERIALS

Peter Maurice Wingfield, deceased, late of Winterbourne Kingston, England, and by Joanna Wingfield, legal representative, Cobblers Cottage, Winterbourne Kingston, Dorset, England

Continuation of Ser. No. 248,693, April 28, 1972, abandoned. This application Jan. 4, 1974, Ser. No. 430,761

Int. Cl.[2] G01R *27/00*

U.S. Cl. 324—57 Q **3 Claims**



1. A system for sensing changes in the internal condition of solid materials using integral sensors embedded within the material wherein the sensors comprise resonant electric circuit means whose electrical characteristics are dependent on the condition of said material together with means for monitoring the electrical characteristics of said resonant electric circuit means, said circuit means comprising inductor means arranged electrically in parallel with capacitor means the dielectric of said capacitor means being formed by parts of said material, the electrical characteristics of said resonant electric circuit means being monitored by variable frequency oscillator means coupled inductively thereto.

3,906,341

FAULT DETECTOR FOR IGNITER TESTING USING HIGH FREQUENCY NOISE

Edward H. Getz, St. Joseph, and Clifford L. DeSchaaf, Stevensville, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 25, 1974, Ser. No. 463,962

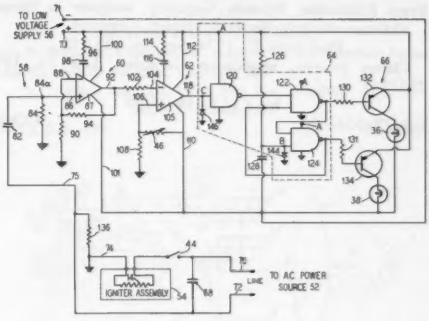
Int. Cl.[2] G01R *27/02*

U.S. Cl. 324—62 **19 Claims**

1. A method of testing electrical resistance type igniters for defects comprising the steps of:

applying an operating voltage to an igniter to effect the generation of noise by a faulty igniter;

comparing the high frequency noise level with a reference level; and



activating an alarm in response to a noise level above the reference level.

3,906,342

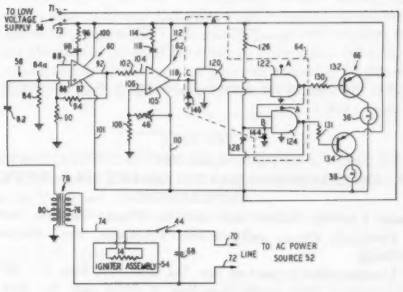
FAULT DETECTOR FOR IGNITER TESTING USING HIGH FREQUENCY NOISE

John Richard Pfouts, Mount Victory, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 25, 1974, Ser. No. 463,963

Int. Cl.[2] G01R *27/02*

U.S. Cl. 324—62 **10 Claims**



1. Apparatus for testing an electrical resistance type igniter for operational defects, comprising:

means for applying an operating voltage to the igniter to cause the generation of high frequency noise by the igniter if it is defective;

an inductive impedance connected to the igniter for sampling signals developed by the igniter; filter means connected to said inductive impedance for passing high frequency noise;

amplifying means connected to said filter means for amplifying the signal received therefrom;

signal level detector means connected to said amplifying means for desensitizing the circuit with respect to noise signals below a reference level; and

signal means connected to said level detector means and operative to indicate a defective igniter.

3,906,343
DIGITAL MAGNETO OPTICAL INSTRUMENT FOR HIGH VOLTAGE SYSTEMS

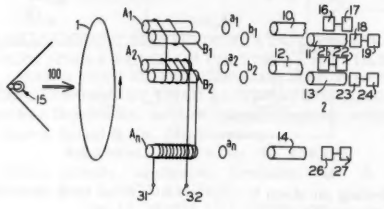
Ernst Feldtkeller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 27, 1974, Ser. No. 483,572

Claims priority, application Germany, June 29, 1973, 2333242

Int. Cl.[2] G01R *31/00*

U.S. Cl. 324—96 **4 Claims**



1. A digital magneto-optical instrument transformer for high voltage systems in which two groups of Faraday shift devices are provided, comprising a first group with n Faraday shift devices $A_1 - A_n$ and a second group of n-1 Faraday shift devices $B_1 - B_{n-1}$, the devices $A_1 - B_1$ producing equal rotation as a function of current, and one of each group of Faraday shift devices having the same rotation angle, and each succeeding pair having rotation, as dependence at angles which are twice as great as the prior pair; and all the Faraday shift devices are mounted between a first and a second polarizer which have polarization planes which differ by an angle which in the case of the devices A_m where $1 \quad m \quad n$ is

$$\phi = \frac{\pi}{2} - \frac{2^{n-m}-1}{2^{n+2-m}}\pi$$

and in the case of the devices B_k where $1 \leq k \leq n-1$ is $\psi_k = \phi_k + (\pi/4.)$

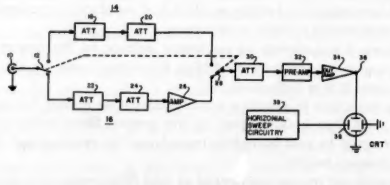
3,906,344
OSCILLOSCOPE HAVING SELECTABLE INPUT IMPEDANCES

John Lindsey Addis, and Ronald Wayne Peltola, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 228,196, Feb. 22, 1972, abandoned. This application Apr. 4, 1974, Ser. No. 457,888

Int. Cl.[2] G01R *13/20, 15/08*

U.S. Cl. 324—121 R **5 Claims**



1. An oscilloscope, comprising:

a cathode-ray tube including vertical and horizontal deflection means for orthogonally deflecting the electron beam,

vertical amplifier means for amplifying the input signal applied thereto and for driving said vertical deflection means,

horizontal circuit means for generating sweep signals for driving said horizontal deflection means,

a single input terminal,

attenuator means including a plurality of selectable attenuators of different input impedance,

wherein the impedance selected remains substantially constant over the attenuation range, and

switch means operated by single operating means for connecting a selected attenuator to said input terminal and to the input of said vertical amplifier and at the same time disconnecting other attenuators from said input terminal and said input of said vertical amplifier,

said switch means and said attenuator means being housed together in a single unitary structure.

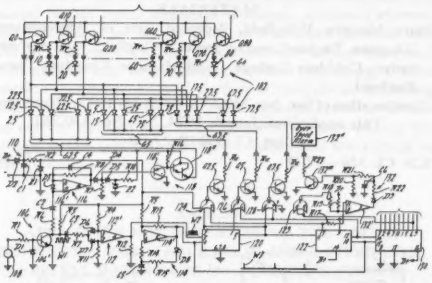
3,906,345
ELECTRO OPTICAL METER SYSTEM HAVING A SERIES LIGHTING DISPLAY AND MATRIX SCANNING

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 3, 1973, Ser. No. 385,414

Int. Cl.[2] G01P *3/48;* **G08B** *23/00*

U.S. Cl. 324—166 **42 Claims**



1. A metering and display system for metering and displaying the value of a parameter comprising: a visual display of a scale representing a range of said parameter and a plurality of elements each of which elements is adapted to emit light when in an energized condition, said elements being arranged in visual association with said scale to form a column coextensive with at least a portion of said scale; means for providing a signal having variations at a frequency representative of the value of said parameter; counting means for counting said variations during a predetermined time interval and a plurality of driver means for intermittently and repetitively energizing each of a selected number of elements along the column formed by said elements such that the elements in said selected number of elements appear to an observer to be continuously lighted, each of said plurality of driver means being adapted to energize differing ones of said elements at differing times during one predetermined time interval so that there are fewer of said driver means than said elements, said selected number of elements being determined by the frequency of said signal whereby the lighted elements form a lighted column which may be read by an observer against the scale to determine the value of said parameter.

3,906,346
PRECISION TIME INTERVAL COMPARATOR

John M. Hunter, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

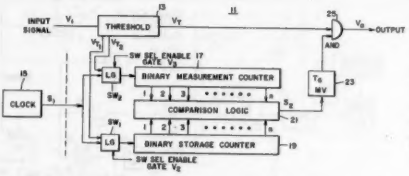
Filed Dec. 26, 1972, Ser. No. 321,483

Int. Cl.[2] G04F *10/00*

U.S. Cl. 324—186 **8 Claims**

1. A time interval comparator to measure and store the time interval between two events while comparing succeeding events against the stored time interval comprising:

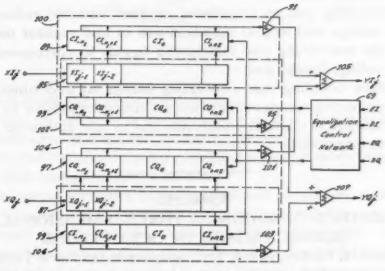
a. a binary storage counter for storing the time interval count between two events;
b. a binary measurement counter for measuring the time interval count between two events;
c. a means for initiating a series of pulsed threshold signals;
d. a means for generating a time delay signal pulse simultaneously with the initiation of the initial threshold signal from said threshold means to store the time delay interval count in said storage counter until the next series threshold signal said time delay generating means initiating said measurement counter at the next series threshold signal until said measurement acquires matching time delay interval count of said storage counter;
e. a means for comparing the equality of the counts between said binary storage counter and said binary measurement counter; and
f. said comparing means generating an output signal to the input of an acceptance gate having a threshold input signal wherein the output signal activates said gate.



3,906,347
TRANSVERSAL EQUALIZER FOR USE IN DOUBLE SIDEBAND QUADRATURE AMPLITUDE MODULATED SYSTEM

David M. Motley, Santa Ana, and King Y. Cheng, Tustin, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Filed Oct. 11, 1973, Ser. No. 405,290
Int. Cl.[2] H04B *3/04*
U.S. Cl. 325—42 **12 Claims**

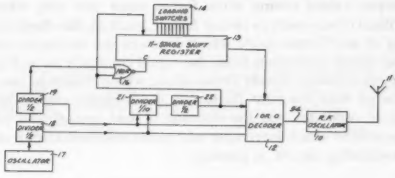


1. A transversal equalizer for correcting the delay and attenuation distortion of an input signal defined by a plurality of digital words, comprising:
a plurality of shift registers sequentially receiving the digital words in the input signal;
multiplying means coupled to the shift registers and responsive solely to partial response detected digital data signals to provide the multiplying means with respective multiplying coefficients for multiplying the digital words stored in the associated shift registers to provide a plurality of products; and
adding means coupled to each of the multipliers for adding the products provided by the multipliers to provide an equalized signal substantially free of the delay and attenuation distortion.

3,906,348
DIGITAL RADIO CONTROL

Colin B. Willmott, Chicago, Ill., assignor to Chamberlain Manufacturing Corporation, Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 389,806
Int. Cl.[2] H04B *1/00*
U.S. Cl. 325—37 **8 Claims**

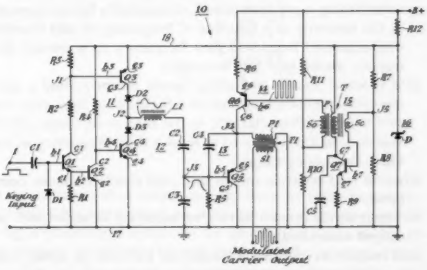


1. A coding system for a transmitter and receiver so that a selected receiver will respond to a particular transmitter comprising a transmitter capable of transmitting a RF signal in a binary code having pulses having time lengths T1 and T2 of different times, means at said transmitter for setting said binary code to a selected combination, a receiver tuned to said RF signal, and including code comparing means receiving the incoming binary code, means at said receiver for setting a binary code to a selected combination supplying an input to said code comparing means, output means actuated by said comparing means if said means for setting a binary code at the transmtiter and receiver are set to the same code combination, wherein said means at said transmitter for setting said binary code includes a plurality of two position switches, a shift register connected to said plurality of two position switches, an oscillator to drive said shift register, divider means connected to said oscillator and to said shift register to reset it, a two pulse length generator connected to said shift register and to said dividers to produce said binary code and a RF oscillator connected to said two pulse generator and keyed thereby to cause it to radiate said binary code.

3,906,349
MODULATED CARRIER TRANSMITTING CIRCUIT

John R. Harrison, Gibsonia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Mar. 23, 1973, Ser. No. 344,185
Int. Cl. H04b *1/04*
U.S. Cl. 325—105 **7 Claims**



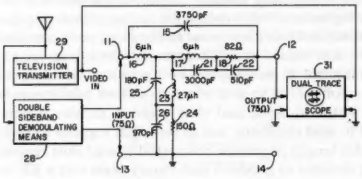
1. A fail-safe electronic transmitting apparatus comprising, a source of d.c. operating potential for powering the apparatus, a voltage regulator connected to said source of d.c. operating potential for regulating said d.c. potential source, said voltage regulator including a Zener diode, a signal oscillator having a resonant frequency determining circuit coupled to

said Zener diode of said voltage regulator for producing a carrier wave, a switching circuit coupled to said Zener diode of said voltage regulator and having a source of square wave pulses connected to its input, an inductive-capacitive network including an inductor and a pair of capacitors connected to the output of said switching circuit for reshaping said square wave pulses into raised cosine wave forms, an amplifying circuit for increasing the amplitude of said carrier wave, and a modulating circuit including a series resonant circuit having an inductor and a capacitor connected to ground via one of said pair of capacitors of said inductive-capacitive network for modulating said carrier wave in accordance with said reshaped raised cosine wave forms when and only when no critical component or circuit failure, such as, the short-circuiting of said Zener diode which removes the necessary biasing and supply potentials from the signal oscillator as well as the open-circuiting of said Zener diode which results in interruption of said resonant frequency determining circuit of said signal oscillator and the opening of said one of said pair of capacitors which interrupts said series resonant circuit of said modulating circuit, is present.

3,906,350
NYQUIST SLOPE FILTER USEFUL FOR MONITORING VIDEO MODULATION AT TRANSMITTING STATION

Ronald E. Musiak, Westfield, Mass., assignor to Comark Industries, Incorporated, Westfield, Mass.

Filed Mar. 12, 1973, Ser. No. 340,084
Int. Cl. H04b *1/02;* **H03l** *7/04*
U.S. Cl. 325—133 **4 Claims**

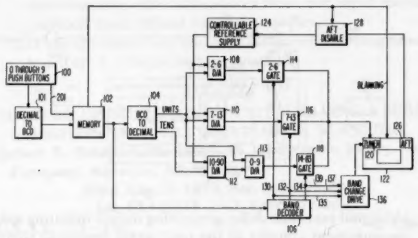


1. Video correction filter apparatus comprising,
means defining an input,
means defining an output,
resistive means and reactive means intercoupling said input and said output,
said resistive means comprising means for establishing a predetermined first finite substantially uniform attenuation between d-c and a first frequency of the transfer characteristic between said input and said output,
said reactive means coacting with said resistive means for establishing a predetermined substantially linear increase in the response as a function of frequency of said transfer characteristic from said first frequency to a second frequency above said first frequency,
said reactive means including means for providing a substantially uniform response as a function of frequency for said transfer characteristic in the frequency range above said second frequency to at least a third frequency in the video frequency range,
wherein said resistive means and said reactive means comprise,
an input series branch having an inductor in series with an output series branch,
said output series branch having an inductor in series with a resistor and each shunted by a capacitor,
a shunt branch interconnecting a common terminal with the junction between said input and output series branches and having an inductor in series with a resistor with each shunted by a capacitor,
and a bridging capacitor intercoupling said input and said output.

3,906,351
DIGITAL TUNING OF VOLTAGE CONTROL TELEVISION TUNERS

Wayne Wheeler Evans, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,383
Int. Cl.² H04B *1/26*
U.S. Cl. 325—459 **11 Claims**



1. In combination with a television receiver having circuitry for developing an automatic fine tuning voltage, apparatus for numerically selecting a channel in an associated voltage controlled tuner comprising:
selecting means for providing binary coded signals responsive to numerical channel commands;
register means for storing said signals in binary coded form;
a reference voltage source;
means responsive to said automatic fine tuning voltage comprising a plurality of resistance elements coupled in series to said reference voltage source, said plurality having at least a first junction for providing a variable reference voltage, and a signal translating stage having an input terminal for receiving said automatic fine tuning voltage and an output terminal coupled to a second junction of said plurality of resistance elements, said translating stage providing a current in response to said automatic fine tuning voltage to said resistance elements which combines with current provided by said reference voltage source;
converting means responsive to said variable reference voltage and to said signals stored in said register means for converting said last-named signals to corresponding voltage levels; and
means coupling said converting means to said tuner for providing tuning voltage to said tuner responsive to said numerical channel commands and to said automatic fine tuning voltage.

3,906,352
METHOD OF MAKING A THREE-DIMENSIONAL SEISMIC PROFILE OF OCEAN FLOOR

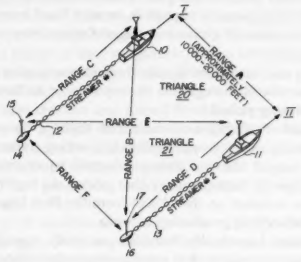
William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Mar. 16, 1973, Ser. No. 342,206
Int. Cl.² G01V *1/20, 1/38*
U.S. Cl. 340—7 R **11 Claims**

1. A method of making a three-dimensional profile of the bottom of a body of water, said method comprising the steps of:
a. simultaneously moving two vessels in precisely controlled relationship along two parallel lines of traverse, each vessel towing an individually associated streamer in the form of a line hydrophone,
b. repeatedly generating cyclically recurring pulses of seismic sound waves on each of said vessels,
c. picking up the reflections of said sound pulses at each of said streamers,

d. interpreting the seismic caused variations in the picked up reflections according to which of said vessels is providing the source of pulses causing said reflections,

e. towing a buoy at the free end of each of said streamers, and

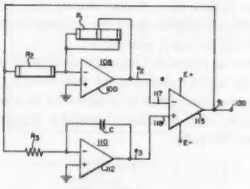


f. interchanging navigational signal measurements via radio channels extending between transponders on said vessels and said buoys in order to maintain said precisely controlled relationship between said two vessels.

3,906,353
OSCILLATOR CIRCUIT FOR PROVIDING A CONDUCTIVITY RATIO OF SEA WATER

Lawrence C. Murdock, Bellevue, Wash., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1973, Ser. No. 404,563
Int. Cl. G01n *27/42*
U.S. Cl. 324—30 R **2 Claims**



1. An oscillator circuit comprising:

a. first circuit means for providing a first output signal indicative of a desired measured parameter;

b. second circuit means for providing a second output signal which varies linearly with time;

c. an output amplifier including first and second inputs and an output and being of the type which provides an output signal which switches between relatively positive and negative output values, depending upon the relative magnitudes of signals applied to said first and second inputs, said output signal being electrically connected to both said first and second circuit means as the input signal thereto;

d. the output of said first circuit means being electrically connected to said first input;

e. the output of said circuit means being electrically connected to said second input; said second circuit means including,

i. a second amplifier having an input and an output;

ii. a capacitor connected in the feedback path between said output and input;

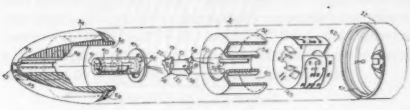
iii. a resistor connected to said input;

iv. the slope of said linearly variable output signal being determined by the values of said capacitor and resistor.

3,906,354
STANDARD CONDUCTIVITY CELL FOR MEASUREMENT OF SEA WATER SALINITY AND TEMPERATURE

Lawrence C. Murdock, Bellevue, Wash., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1973, Ser. No. 404,564
Int. Cl. G01n *27/42*
U.S. Cl. 324—30 B **14 Claims**



1. A standard cell comprising:

A. first and second electrically insulative, relatively thin members having spaced apart surface portions;

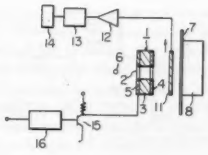
B. a thin film of a standard sample of electrically conducting liquid of a known predetermined parameter contained between said surface portions and having a thickness less than the thickness of at least one of said insulative members; and

C. first and second electrodes supported by said insulative members and being in electrical contact with said standard sample.

3,906,355
METHOD AND APPARATUS FOR TESTING AN APERTURE BOARD IN A HIGH SPEED PRINTER

Akinori Watanabe, and Katsuhide Tanoshima, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed July 26, 1974, Ser. No. 492,340
Int. Cl.[2] G01N *27/60*
U.S. Cl. 324—33 **4 Claims**



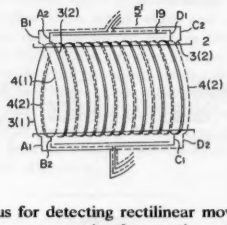
1. In the method of testing an ink mist type printer comprising means for generating an ion stream, an aperture board having a plurality of apertures for modulating said ion stream and charging an ink mist flowing in front of the aperture board according to the pattern of characters to be printed, and printing medium arranged parallel to the flow of said ink mist for printing characters by attracting the charged ink mist, the improved step of inserting a conductive board between said aperture board and said printing medium for detecting the presence of an obstructed aperture by measuring the electric current created by the ion stream in said conductive board.

3,906,356

APPARATUS USING SOLENOID COILS FOR DETECTING RECTILINEAR MOVEMENT

Takao Manabe, and Satosi Kumamoto, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed June 7, 1974, Ser. No. 477,429
Claims priority, application Japan, June 12, 1973, 48-66161
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—34 D 3 Claims



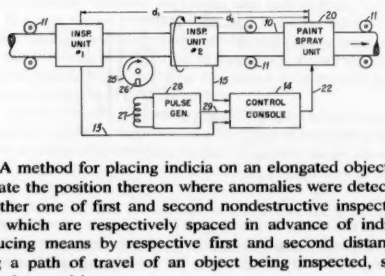
1. In apparatus for detecting rectilinear movement of the type comprising a screw made of magnetic material and provided with a single screw thread of a predetermined pitch, and a detection coil, said detection coil including: (i) a bobbin slidably containing said screw and provided with double screw threads formed on its outer surface and having a pitch of one half of said predetermined pitch, (ii) a pair of solenoid coils wound in alternate valleys of said double screw threads, and (iii) lead conductors connected to the opposite ends of said solenoid coils, the lead conductors of one solenoid coil being 180° apart from the lead conductors at the other solenoid coil, whereby the difference in the inductances of said pair of solenoid coils is detected for measuring the relative rectilinear movement between said screw and said detection coil, the improvement wherein the inductances of the opposite ends of said solenoid coils are made smaller than the inductances of the intermediate portions of said solenoid coils.

3,906,357

METHOD AND APPARATUS FOR TESTING AN OBJECT FOR FLAWS CONSISTING OF TWO SENSORS SPACED APART ALONG THE OBJECT PATH AND EACH CONNECTED TO A COMMON MARKER

Anthony A. Runshang, Sewickley, Pa., assignor to AMF Incorporated, White Plains, N.Y.

Filed June 29, 1973, Ser. No. 374,919
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 4 Claims



1. A method for placing indicia on an elongated object to indicate the position thereon where anomalies were detected by either one of first and second nondestructive inspecting units which are respectively spaced in advance of indicia producing means by respective first and second distances along a path of travel of an object being inspected, said method comprising

moving said object along said path in one given direction to successively pass through said inspecting units and said indicia producing means,

producing a timing pulse each time the object moves an incremental unit of length along said path,

in said first inspecting unit producing anomaly signals in respective ones of N fixed inspection means disposed about said path in N angular segments in response to detected potentially harmful anomalies in corresponding angular segments of the object,

said fixed inspecting means and said angular segments of the object being successively numbered proceeding in a given direction around said path from a reference position,

transferring anomaly signals from said fixed inspection means to the inputs of a selected stage of respective ones of N shift registers,

shifting said anomaly signals through successive stages of the respective shift registers in response to successively occuring timing pulses,

the number of stages of each shift register through which an anomaly signal from the first inspecting means is shifted to the output thereof being selected to correspond to the number of timing pulses that occur during the travel of a given position on the object from the first inspecting means to the indicia producing means,

producing potentially harmful anomaly signals by second inspecting means that rotates about the object and successively scans said angular segments,

producing a succession of N successively occuring angular segment pulses each of which has a time of occurrence and duration corresponding to the time the second inspection means is in a correspondingly numbered angular segment, directing by means of the angular segment pulses anomaly signals from the second inspecting means to respective ones of N signal lines to cause a second inspecting means anomaly signal emanating from a given numbered angular segment to occur on a correspondingly numbered signal line, transferring second inspection means anomaly signals on said signal lines to respective inputs of a second selected stage of correspondingly numbered ones of said shift registers, whereby the second inspection means anomaly signals are shifted through said registers by said timing pulses,

the number of stages of each shift register through which second inspecting means anomaly signals are shifted to the output thereof being selected to correspond to the number of timing pulses that occur during the travel of a given position on the object from the second inspecting means to the indicia producing means,

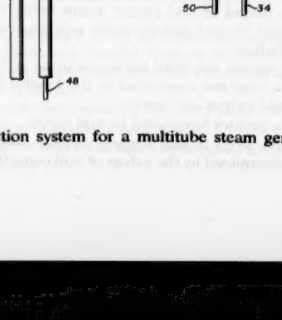
coupling anomaly signals from the output of each of said shift registers to a correspondingly numbered one of N indicia producing means which is positioned to place an indicia on a correspondingly numbered angular segment of the object as it passes thereby.

3,906,358

PROBE TRAIN INCLUDING A FLAW DETECTOR AND A RADIATION RESPONSIVE RECORDING MEANS WITH ALIGNMENT MEANS HAVING A NATURAL CURVED CAST

Robert Martin Stone, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 12, 1973, Ser. No. 415,060
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 2 Claims



1. An inspection system for a multitube steam generator comprising:

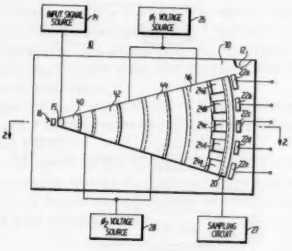
a. a probe train for insertion in a tube to be inspected including, in series:
   i. directional probe means for indicating the longitudinal and angular location of an irregularity at the wall of said tube, and
   ii. radiation responsive recording means, nonrotatable relative to said directional probe means and in substantially close longitudinal relationship thereto, for receiving an image of said irregularity when laterally adjacent thereto and said irregularity is irradiated;
b. elongated alignment means having a resilient, naturally curved cast thereto and joined to at least one end of said probe train against rotation relative thereto and insertable in said tube for controlling the angular orientation of said probe train within said tube;
c. means for propelling said probe train longitudinally within said tube; and
d. a source of radiation insertable in another tube of said steam generator to a position therealong laterally adjacent said indicated irregularity for irradiating said irregularity to project said image on said recording means.

3,906,359

MAGNETIC FIELD SENSING CCD DEVICE WITH A SLOWER OUTPUT SAMPLING RATE THAN THE TRANSFER RATE YIELDING AN INTEGRATION

Franklyn C. Blaha, Glen Burnie, and Harry G. Oehler, Laurel, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 6, 1973, Ser. No. 386,253
Int. Cl.[2] G01R *33/02*; **H01L** *29/78*
U.S. Cl. 324—43 R **10 Claims**



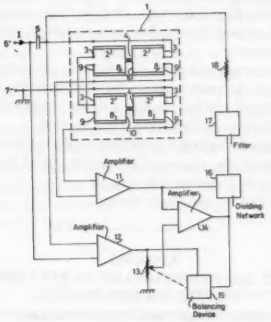
1. A charge coupled device (CCD) for sensing a magnetic field, said CCD comprising:
a. a substrate of semiconductor material for providing a path for the passage of minority carriers therethrough;
b. a first layer of dielectric material overlying said substrate;
c. source means for injecting a substantially uniform distribution of minority carriers within said substrate;
d. first and second output means for collecting the minority carriers directed along said path of said substrate and each providing an output signal indicative of the collected minority carriers;
e. a plurality of electrodes disposed along said path of said CCD between said source means and said first and second output means and overlying said first layer of dielectric material for defining underlying portions of said substrate wherein minority carriers are collected;
f. means for applying varying potential signals to said electrodes for directing the minority carriers at a first rate from one underlying portion to the next along the path of said substrate, whereby the minority carriers are deflected as they are directed through the substrate in the presence of the magnetic field;
g. an input gate electrode disposed upon said first layer of dielectric material intermediate said source means and the first of said plurality of electrodes;
h. input signal source means electrically coupled to said input gate electrode for controlling the travel of minority carriers to said plurality of electrodes;
i. a sampling electrode disposed upon said first layer of dielectric material intermediate the last of said plurality of electrodes and said first and second output means;
j. output signal source means electrically coupled to said sampling electrode for applying sampling signals to said sampling electrode at a second rate, slow with respect to the first rate whereby the minority carriers are permitted to be stored in that region beneath the last of said plurality of electrodes for a relatively long integration period before being sampled by the application of a sampling signal derived from said sampling means; and
k. said first and second output means spaced from each other and disposed traverse to the path for collecting the minority carriers as deflected by the magnetic field, the output signals derived at said first and second output means indicating the strength and direction of the magnetic field.

3,906,360

METHOD FOR ELECTRICAL DAMPING OF MECHANICAL DISTURBANCES IN A MAGNETIC FIELD MEASURING SYSTEM

Gunnar S. Soredal, and Curt Sivers, both of Stockholm, Sweden, assignors to LKB-Produkter AB, Bromma, Sweden

Filed Mar. 1, 1974, Ser. No. 447,207
Claims priority, application Sweden, Mar. 1, 1973, 7302874
Int. Cl.[2] G01R *33/02*
U.S. Cl. 324—43 R **3 Claims**

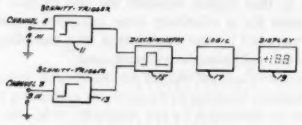


1. In a method for reducing the influence of mechanical disturbances in a magnetic field measuring system of the type consisting of a transducer comprising a loop arranged in the field and oscillatable in response to interaction between the field and a current in the loop and supplied by an alternating current having a frequency considerably higher than the mechanical resonant frequency of the loop, the voltage generated across the loop due to its movement in the magnetic field being proportional to the square of the strength of the magnetic field the measurement being performed by comparing the induced voltage and a variable voltage being 90 degrees phase shifted in respect to the current of the supply circuit, said comparison generating a signal comprising a component of said alternating current frequency which component constitutes an error signal which increases or decreases said variable voltage in order to decrease said component, the improvement comprising the step of feeding back to the loop any component of the mechanical resonant frequency of said error signal to obtain a damping of oscillations of the mechanical resonant frequency of the system.

3,906,361
DIGITAL PHASE MEASURING SYSTEM

Norbert Nessler, and Dieter Fritz, both of Innsbruck, Austria, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 26, 1973, Ser. No. 401,005
Int. Cl.[2] G01R *25/00*
U.S. Cl. 324—83 D **3 Claims**



1. A system for measuring the phase difference between two input signals comprising:

a. first and second Schmitt trigger channels fed by one each of the two input signals for converting said signals into square waves wherein the first and second Schmitt trigger channels have null hysteresis and each channel includes:
   1. an inverting transistor fed by one input signal,
   2. first and second impedance transforming transistors fed by respectively the input signal and the inverting transistor,
   3. first and second Schmitt trigger operational amplifiers fed respectively by the first and second impedance transforming transistors, and
   4. a first flip-flop fed by the first and second operational amplifiers and having first and second complementary output states;

b. a discriminator fed by the square wave outputs of the first and second Schmitt triggers for determining the coincidence thereof and producing a signal proportional to the phase difference of the two input signals;

c. logic means including a counting oscillator for converting the length of the phase proportional signal from the discriminator to a digital signal; and

d. a display fed by the logic means.

3,906,362
CHART ADAPTER FOR USE IN RECORDING OSCILLOSCOPE DATA

Richard H. Morris, Tampa, and Harry F. Strenglein, Clearwater, both of Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,600
Int. Cl.[2] G01R *13/04, 13/20, 13/30*
U.S. Cl. 324—113 **10 Claims**

1. Apparatus for simultaneously displaying and recording information on an oscilloscope and on an X-Y plotter respectively, said oscilloscope and said plotter each having signal and sweep input terminals, said apparatus including:

sweep generating means for generating relatively slow or relatively fast oscilloscope sweep voltage pulses in response to slow and fast sweep command signals, respectively.

means for producing alternately, a group of consecutive fast sweep command signals and a single slow sweep command signal,

means including resettable counter means for producing a first step-like oscilloscope deflection voltage that increases in magnitude with each of said fast sweep command signals in a given group,

means for switching said first step-like voltage to the signal deflection terminal of an oscilloscope during the occurrence of said fast sweep voltages and an externally generated data input signal to the same terminal during the occurrence of a slow sweep command signal,

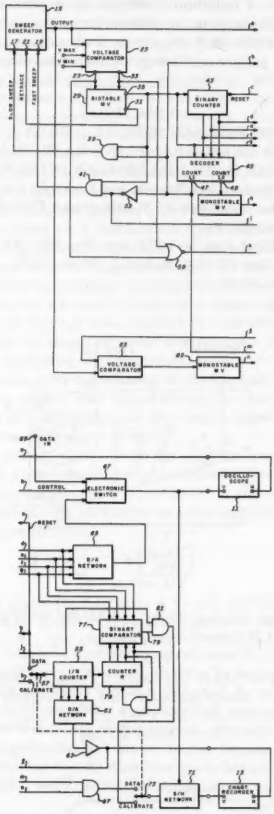
dual position selection means for operating said plotter in either a DATA or a CALIBRATE mode,

means including recycling counter means for producing step-like plotter sweep voltages having a magnitude indicative of the binary state of the recycling counter means,

means for advancing said recycling counter after the completion of each slow sweep command signal when the selection means is in the DATA position, and after the completion of each oscilloscope sweep voltage pulse when the selection means is in the CALIBRATE position,

additional counter means for counting the number of times said recycling counter is advanced to its maximum possible count,

means for producing a comparator signal whenever the binary states of said resettable counting means and said additional counting means are equal,



means for producing a CALIBRATE sampling signal whenever a comparator signal occurs during the time that a group of fast sweep command signals is being produced,

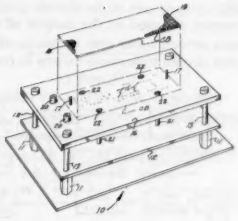
means for producing a DATA sampling signal whenever the magnitude of one of said relatively slow oscilloscope sweep voltage pulses exceeds the magnitude of said plotter sweep voltage, and

means for applying a voltage equal to the output of said switching means to the signal input terminal of a plotter in response to a DATA sampling signal or a CALIBRATE sampling signal when the selection means is in the DATA or CALIBRATE positions, respectively.

3,906,363
CIRCUIT BOARD CONTINUITY TESTING DEVICE

Richard O. Fowler, 4820 S.W. Menlo, Beaverton, Oreg. 97005

Filed Sept. 9, 1974, Ser. No. 504,506
Int. Cl.² G01R 1/06, 31/02
U.S. Cl. 324—158 F 7 Claims



1. A device for testing circuit board continuity, said device comprising in combination,

a base including a plate, metallic spring contact fingers mounted on said plate and projecting upwardly therefrom, each of said spring fingers in circuit with supplemental test equipment, upright guides on said base,

a finger biasing plate mounted on said upright guides and adapted for reciprocal motion therealong, said biasing plate defining openings therein each having a spring finger therewithin, said biasing plate openings offset to one side from the plate mounted portions of their respective spring fingers so as to cause displacement of each finger during closing movement of said biasing plate towards said base,

said biasing plate adapted to temporarily receive a superimposed perforate circuit board to be tested with certain of said perforations constituting board terminals, said certain of the terminal perforations receiving the upper segment of a spring contact finger upon the circuit board being superimposed on said plate,

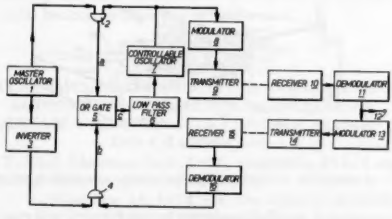
means subjacent the circuit board to limit downward travel of same during closing movement of the biasing plate and base, and

said upper segments of the fingers being displaced into positive engagement with their respective terminal perforations in the circuit board during closing movement between said base and said biasing plate.

3,906,364
SIGNAL TRANSMISSION SYSTEMS WITH DOPPLER SHIFT COMPENSATION

William Dobson, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed July 27, 1973, Ser. No. 383,324
Int. Cl.² H04B 7/26
U.S. Cl. 325—4 7 Claims

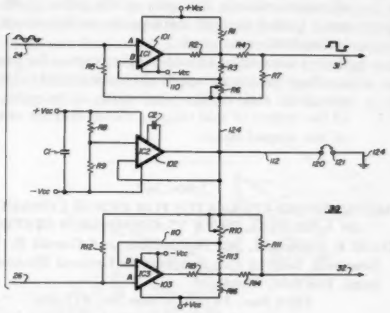


2. A transmission system as claimed in claim 1 wherein the signal having the said first frequency and the signal having the said second frequency have a rectangular waveform.

3,906,365
LIMITER CIRCUIT

Henry Allan Richardson, and Daniele Sellari, Jr., both of Corinth, Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 339,707, March 9, 1973, abandoned.
This application June 21, 1974, Ser. No. 483,933
Int. Cl.² H03K 5/08
U.S. Cl. 328—31 4 Claims

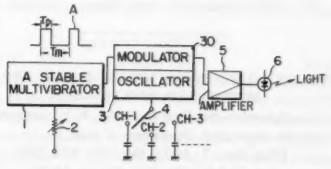


1. A limiter circuit for producing a square wave output in response to a sinusoidal signal input of more than a predetermined amplitude, the apparatus comprising a single operational amplifier having a first and a second input, a passive feedback network coupled to said first input of said amplifier for switching the voltage level to said first input responsive to changes in output from said amplifier, said feedback network including a portion of a resistive voltage divider across a source of direct current, an adjustable threshold setting means providing a reference voltage to said first input, the second input coupled to a source of sinusoidal signals to provide a signal from said sinusoidal signal input for comparison with the amplitude of said first input of said amplifier wherein said amplifier responds to signals at said second input above said threshold to produce a square wave output of the same polarity as the input signal.

3,906,366
REMOTE CONTROL SYSTEM

Shunji Minami, Moriguchi; Takehide Takemura, and Shunzo Oka, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 10, 1973, Ser. No. 423,200
Claims priority, application Japan, Dec. 13, 1972, 47-125667
Int. Cl.² H04B 7/00
U.S. Cl. 325—37 12 Claims



1. A remote control system comprising

A. a transmitter comprising

a. a high-frequency oscillator having a selectively variable oscillation frequency;

b. means for varying the power output of said high-frequency oscillator as a continuous function; and

c. means for transmitting the output of said high-frequency oscillator; and

B. a receiver comprising

d. means for receiving said transmitted output from said transmitter;

e. means for discriminating the received signal depending upon the frequency;

f. means for shaping the discriminated signal into a series of pulses wherein the ratio of the pulse width to the pulse period thereof corresponds to the power of the transmitted signal; and

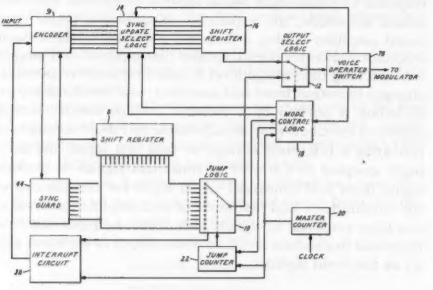
g. means connected to said shaping means for providing a voltage having an amplitude proportional to the product of the ratio of the pulse width to the pulse period of the output of said shaping means and the amplitude of the shaped signal.

3,906,367

METHOD AND APPARATUS FOR ERROR CORRECTION IN A DIGITAL DATA TRANSMISSION SYSTEM

David F. Hoeschele, Jr., Norristown, and Gerald B. Berger, Broomall, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Nov. 19, 1973, Ser. No. 417,401
Int. Cl.[2] H03K *13/32, 13/22*
U.S. Cl. 325—38 B **30 Claims**



19. The method for inserting a data word into a periodically digitally encoded data signal comprising the steps of:

a. delaying and storing the periodically digitally encoded data signal for a first discrete number of periods while transmitting said inserted data word;

b. transmitting said delayed periodically digitally encoded data signal after completion of transmission of said inserted data word;

c. at each of a plurality of steps reducing the first discrete number of periods by a second discrete number of periods less than the said first number and at the same time interrupting the digital encoding of the data signal for the second discrete number of periods.

3,906,368

AUTOMATIC ALIGNMENT METHOD AND APPARATUS FOR TUNER MECHANISM

Robert Roy Eckenbrecht, East Bethany, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

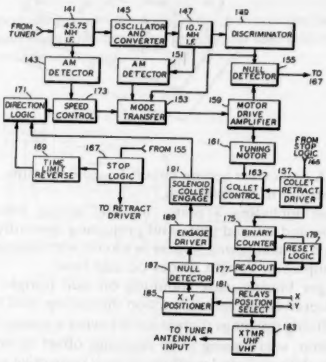
Filed Dec. 7, 1973, Ser. No. 422,928
Int. Cl.[2] H04B *1/06;* **H03G** *11/04*
U.S. Cl. 325—452 **4 Claims**

1. Apparatus for automatically selecting signals and adjusting controls of a plurality of signal channels to effect pre-set tuning of the signal channels of a tuner in a television receiver comprising:

signal source means coupled to said tuner for sequentially providing signals at different frequencies for pre-set tuning a plurality of signal channels said different frequencies corresponding to the tuned frequencies of said signal channels;

motor driven tuner arm means formed for engagement with and adjustment of said controls of said plurality of signal channels;

detector means coupled to the output of said tuner and to said motor driven tuner arm means to effect activation of said motor driven tuner arm means in response to a signal



from said tuner and cause pre-set tuning of a first signal channel; and

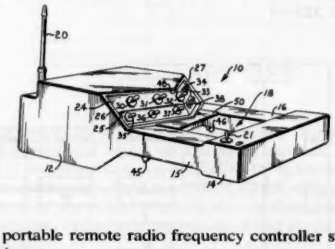
sequential stepping means coupled to said detector and motor driven tuner arm means and to said signal source means, said sequential stepping means automatically moving said motor driven tuner arm means to said adjustable control of a second signal channel and selecting a second signal from said signal source means for tuning of said second signal channel in response to a signal from said detector and motor driven tuner arm means indicating pre-set tuning of said first signal channel.

3,906,369

FUNCTION SWITCH ARRANGEMENT FOR HAND-HELD REMOTE CONTROL UNIT

Raymond F. Pitman, Prairie Village, Kans., and William T. Dale, Euless, Tex., assignors to R O Products, Inc., Olathe, Kans.

Filed Sept. 18, 1974, Ser. No. 507,013
Int. Cl.[2] H01H *9/06, 13/08;* **H04B** *1/034*
U.S. Cl. 325—111 **9 Claims**



1. A portable remote radio frequency controller structure comprising

two spaced, parallel handgrips having forward and rearward ends,

a switch console at the forward ends of said handgrips, said console having a horizontal profile in the form of a V with the apex of the V extending toward the space between the

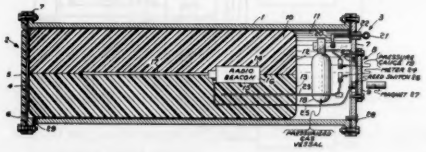
handgrips, said console further including switch mounting surfaces in the form of a pair of inclined symmetrically diverging planes intersecting on the apex and extending forwardly and upwardly relative to said handgrips, and

an array of thumb actuated function switch operating members mounted on and extending from said mounting surfaces, each switch in the array being located within range of an operator's thumb while the fingers hold the handgrips.

3,906,370
RADIO BEACON ENCLOSURE

David John Apps, Raleigh, N.C., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 28, 1974, Ser. No. 501,129
Int. Cl.[2] H04B *1/034*
U.S. Cl. 325—114 **12 Claims**



1. A radio beacon enclosure capable of automatically ejecting a radio beacon to enable said radio beacon to float free in water comprising:

a metallic tubular housing having a longitudinal axis;

a rupturable wall disposed transverse to said axis to close one end of said housing;

a second wall disposed transverse to said axis sealed to the other end of said housing;

a plastic cylinder disposed within said housing coaxial of said axis adjacent said one end of said housing, the outer surface of said cylinder being in a slideable relation with the inner surface of said housing, said cylinder being separable into two longitudinal half sections, each of said half sections having cooperating cavities coaxial of said axis to house said radio beacon;

a pressurized gas vessel disposed in said housing between an end of said cylinder adjacent said other end of said housing and said second wall;

a normally closed valve coupled to said vessel; and

a lever connected to said valve and extending through said second wall in a sealed relation thereto;

said rupturable wall having pressure applied thereto by said pressurized gas and said cylinder having pressure applied to said end of said cylinder adjacent said other end of said housing by said pressurized gas when said lever is actuated and said valve is opened, said pressure rupturing said rupturable wall and ejecting said cylinder from said housing through said ruptured rupturable wall to enable said cylinder to separate into its two half sections thereby freeing said radio beacon from said cavities to enable said radio beacon to float free in said water.

3,906,371
REPLACEMENT RADIO RECEIVER APPARATUS FOR AUTOMOTIVE INSTALLATIONS INCLUDING ADJUSTABLY POSITIONABLE CONTROL ELEMENTS AND CHASSIS CASE

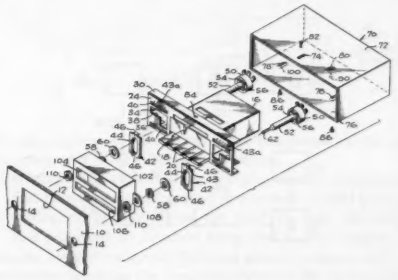
Tom T. Tsuji, Monterey Park, Calif., assignor to J.I.L. Corporation of America, Inc., Carson, Calif.

Filed Jan. 25, 1974, Ser. No. 436,508
Int. Cl. H04b *1/08*
U.S. Cl. 325—352 **8 Claims**

1. Replacement radio receiving apparatus adapted to be mounted in an instrument panel having an existing cutout for tuning means and tuning indicator means and existing apertures laterally adjacent said cutout for receiving control element means, comprising:

a chassis carrying radio receiving means including tuning means and control element means projecting from a forward portion of said chassis and further including tuning indicator means disposed along said forward portion;

a face plate attached to said forward portion of said chassis and having a central opening through which said tuning means projects, said face plate including, laterally adjacent said central opening and on each side thereof, a control element means opening comprising intersecting vertical and horizontal slots, a control element means being mounted in each said control element opening, said control element means being adjustably positionable in said opening along said vertical and horizontal slots



whereby said tuning means and said control elements may be aligned with said existing cutout and apertures in said instrument panel, said face plate further including a pair of parallel, horizontal guide slits associated with each control element means opening, each of said slits extending the full horizontal length of said opening one of said slits being positioned above said opening and the other being positioned below said opening;

guide plate means at least partially overlying each said control element means opening, each said guide plate means having a vertical slot through which said control element means extends and upper and lower tabs projecting into said horizontal guide slits, the position of said guide plate means being laterally adjustable relative to said face plate to any position along the length of said guide slits; and

an exterior case enclosing said chassis

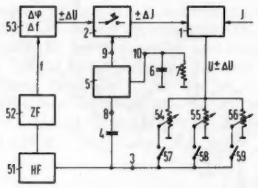
3,906,372
CIRCUIT ARRANGEMENT FOR AUTOMATIC FREQUENCY FINE TUNING IN RADIO AND TELEVISION RECEIVERS

Eckart Schatter, and Hans Kriedt, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 20, 1974, Ser. No. 453,057
Claims priority, application Germany, Mar. 29, 1973, 2315798
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—418 **16 Claims**

1. In a circuit arrangement for automatic frequency fine tuning, in radio and television receivers, of transmissions of different frequencies which are individually selectable by the use of respective tuning voltages, comprising a voltage supply circuit operable to selectively provide respective tuning voltages to the tunable transmission-selecting circuit of such a receiver, a voltage supply circuit operable to provide a fine tuning voltage derived from a received transmission, means to which said fine tuning voltage is supplied, operatively disposed in the said first-mentioned supply circuit for operatively forming the respective tuning and fine tuning voltages as a single

tuning control voltage for the tunable transmission-selecting circuit of the receiver, electrical switch means disposed in said fine-tuning voltage supply circuit for operatively disconnecting the latter from said tunable transmission-selecting circuit of such a receiver, semiconductor control means responsive to predetermined changes in the tuning control voltage for opening said switch means to effect such disconnection upon the occurrence of such a change, said control means having an input to which said tuning control voltage is supplied, and an output from which a control voltage is supplied to said switch means, said control means comprising a differential amplifier to which said tuning control voltage is operatively conducted, first semiconductor means having its output connected to the output of said control means, operative to control the appearance of such control voltage thereat, and second semiconductor means having its input operatively connected to said output of said differential amplifier and its output connected to the input of said first semiconductor means, operative to actuate said first semiconductor means to supply said control voltage as said output upon predetermined output conditions of said differential amplifier, resulting from a voltage change in the tuning control voltage at said input, and a timing circuit operatively connected to said control means for maintaining the latter operative and thus the switch open for a predetermined period of time following such a change in the control voltage, said timing circuit being operatively connected to said first semiconductor means, operative to render the latter operative for a predetermined period of time following deactivation of said second semiconductor means at the conclusion of such a change in the tuning control voltage.



3,906,373

VARACTOR TUNING SYSTEM

Melvin C. Hendrickson, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 331,921, Feb. 12, 1973, Pat. No. 3,878,466. This application Sept. 23, 1974, Ser. No. 508,138
Int. Cl.[2] H03J *5/24;* **H04B** *1/16*
U.S. Cl. 325—468 **7 Claims**

1. A combined UHF and VHF television channel selector comprising:

tuning means including a plurality of varactors as the frequency determining elements, the frequency determined being a function of the voltage presented to a respectively terminal of each such varactor;

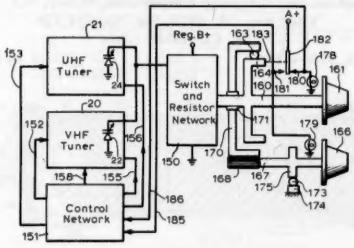
a rotary switch having a predetermined number of fixed contacts respectively associated with different channels in the VHF and UHf television spectra and at least one selection contact movable over respective different ones of said fixed contacts;

a voltage divider composed of a plurality of resistors series connected in succession with individually progressive different junctions between said resistors connected to respective different ones of said fixed contacts;

means for impressing a D-C potential across said voltage divider;

fast-tuning means including a first rotatable shaft coupled to said selection contact for driving the same from each one of said fixed contacts to the next;

means for detenting said first shaft each time upon movement of said selection contact successively between a chosen number of said fixed contacts, said number being greater than two



slow-tuning means including a second shaft;

a gear system mechanically coupling said second shaft to said first shaft;

means for detenting said second shaft in rotational increments corresponding to movement of said selection contact, through said gear system and said first shaft, from each one of said fixed contacts to the next;

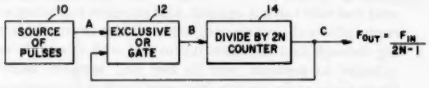
and means for selectively coupling said selection contact to each of said varactors for establishing a tuning frequency.

3,906,374

SYMMETRICAL ODD-MODULUS FREQUENCY DIVIDER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Alexander Engel, La Canada, Calif.

Filed Mar. 12, 1974, Ser. No. 450,503
Int. Cl.[2] H03K *21/00*
U.S. Cl. 328—41 **6 Claims**



1. A system for dividing the signals from a symmetrical frequency source by an odd-modulus and achieving a symmetrical output comprising

a counter having an input and an output indicative of its 2N count state, where N equals the odd-modulus division desired plus one divided by two, and

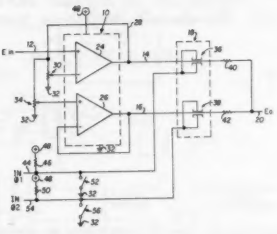
gate means for applying either output signals from said symmetrical frequency source or the 2N count state output of said counter to said counter input to be counted whereby the frequency of the full count state output of said counter is an odd-modulus of the frequency of said symmetrical frequency source and said counter produces a symmetrical waveform output in response to each 2N input pulses.

3,906,375

CONSTANT GAIN SWITCHING AMPLIFIER APPARATUS

Charles M. Dennison, Hiawatha, and Noel E. Hogue, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 8, 1974, Ser. No. 440,943
Int. Cl. H03k 17/02, 1/14
U.S. Cl. 328—71 2 Claims



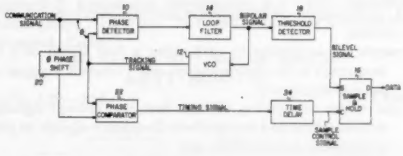
1. Amplifying apparatus comprising, in combination:
first means for supplying reference input signals;
second means for supplying pulse width modulated constant frequency input signals;
apparatus output means;
third means, including reference signal input means, modulating input means and output means, for supplying alternating signals at said output means thereof which have an average value directly proportional to the average value of a reference signal supplied to said reference signal input means thereof and wherein the average value is also directly proportional to the pulse width of a signal supplied to said modulating input means thereof;
means connecting said first means to said reference signal input means of said third means;
means connecting said second means to said modulating input means of said third means; and
means connecting said apparatus output means to said output means of said third means.

3,906,376

SYNCHRONOUS DIFFERENTIALLY COHERENT PSK DEMODULATION

Larry F. Bass, Mission Vieja, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 3, 1974, Ser. No. 475,551
Int. Cl.[2] H04L 27/22; H03D 3/24
U.S. Cl. 329—104 12 Claims



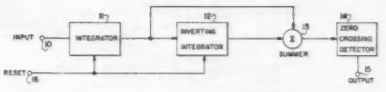
1. A demodulator for demodulating a synchronous differentially coherent PSK communication signal wherein the modulation phase shift is ϕ, comprising:
phase lock loop circuit means for receiving the communication signal and generating in response thereto a tracking signal which differs in phase therefrom by an amount ϕ once phase lock is achieved and for providing a D.C. analog output linearly proportional to the phase difference between the communication and tracking signal and wherein phase lock is lost at the beginning but restored prior to the end of each bit period of the communication signal;
sample control circuit means for detecting each time phase lock is lost and generating in response thereto a sample control signal; and
sample and hold circuit means responsive to the sample control signal for sampling the D.C. analog output of said phase lock loop circuit means and holding the sampled value until receipt of the next sample control signal.

3,906,377

PULSE CENTROID DETECTOR

Robert W. Harris, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 23, 1974, Ser. No. 491,020
Int. Cl.[2] H03K 5/20; G06G 7/18
U.S. Cl. 328—108 3 Claims



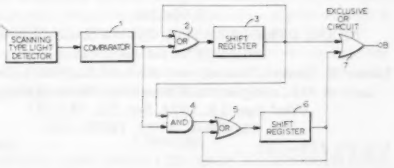
1. An apparatus for providing an indication of the time occurance of a pulse centroid comprising:
first integrating means for receiving an electrical input pulse and providing an integrated first output of said pulse;
inverting integrating means for receiving said first output and providing an inverted integrated second output;
means for summing said first and second outputs; and
mean for detecting the time occurrence of the zero crossing of said summed first and second outputs.

3,906,378

ELECTRONIC CIRCUIT FOR ELIMINATING COINCIDENTAL SIGNAL FROM HYBRID SIGNALS

Toshio Takahashi, Honjo; Ryosaku Tagaya, Isezaki, and Toshiyasu Ehara, Misato-mura, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,363
Claims priority, application Japan, July 9, 1973, 48-76597
Int. Cl.[2] H03K 05/20
U.S. Cl. 328—110 8 Claims



1. An electronic circuit system for eliminating the coincidental pulse or pulses from hybrid pulse consisting of said coincidental pulses and the anti-coincidental pulse or pulses appearing in the scanning frames of an electric signal, comprising:
a. a comparator for receiving the output signal consisting of said hybrid pulse of a scanning-type light detector;
b. a first register circuit for receiving through an OR circuit the output of the comparator, and storing, for a period of one scanning cycle, said received output signal;
c. a circuit for feeding the output of said shift register back to its own input through the OR circuit;
d. an AND circuit for receiving the output of the comparator together with the output of the first shift register;
e. a second register circuit for receiving through an OR circuit the output of said AND circuit, and for storing, for a period of one scanning cycle, said received output signal;

f. a circuit for feeding the output of said second shift register back to its own input, through the OR circuit; and

g. an EXCLUSIVE OR circuit for receiving the outputs of said first and second shift registers.

3,906,379

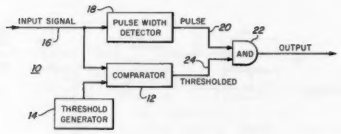
THRESHOLD ERROR COMPENSATOR FOR PULSE WIDTH MEASUREMENT CIRCUIT

Richard H. Tuhro, Norwood, Mass., assignor to Computer Identics Corporation, Westwood, Mass.

Filed Apr. 25, 1974, Ser. No. 464,137

Int. Cl.[2] H03K *5/20*

U.S. Cl. 328—112 **2 Claims**



1. An improved pulse width measuring system comprising:

a pulse width measuring circuit, responsive to an input signal, for determining the width of an input signal pulse at a predetermined relative amplitude level and providing a pulse width signal representative thereof;

a noise rejecting threshold circuit for generating a threshold level exceeding an expected noise level in said input signal;

a comparator circuit, responsive to said threshold level and said input signal, for providing thresholded signal pulses in response to the input signal amplitude exceeding said threshold level and rejecting lower amplitude input signal portions as noise; and

a gating circuit, responsive to said pulse width measuring circuit and said comparator circuit, for passing only said pulse width signals occurring concurrently with said threshold signal pulses and rejecting other pulse width signals as noise.

3,906,380

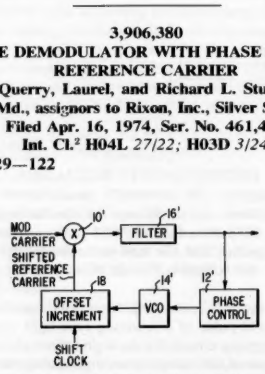
PHASE DEMODULATOR WITH PHASE SHIFTED REFERENCE CARRIER

Lester R. Querry, Laurel, and Richard L. Stuart, Beltsville, both of Md., assignors to Rixon, Inc., Silver Spring, Md.

Filed Apr. 16, 1974, Ser. No. 461,427

Int. Cl.[2] H04L *27/22;* **H03D** *3/24*

U.S. Cl. 329—122 **10 Claims**



1. A method of demodulating a phase-difference modulated carrier with a repeated phase offset increment, said method comprising the steps of generating a reference carrier, shifting the reference carrier with a repeated phase offset equal to the offset increment introduced into the modulated carrier so as to produce a phase offset reference carrier, and applying the received modulated carrier to one input of a mixer and applying the phase offset shifted reference carrier to a second input of said mixer to produce a demodulated phase signal.

3,906,381

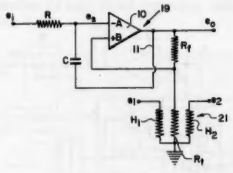
INTEGRATOR CIRCUIT AND LOW FREQUENCY TWO PHASE OSCILLATOR INCORPORATING SAME

Allan I. Bennett, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 24, 1974, Ser. No. 436,279

Int. Cl.[2] G06G *7/18*

U.S. Cl. 328—128 **2 Claims**



1. An integrator circuit comprising an operational amplifier having first and second input terminals and an output, said first terminal being adapted for connection with an input voltage source and including a resistor between said input source and first terminal; a first negative feedback loop connected between said output terminal and said first input terminal, said first feedback loop including a capacitor, and a second positive feedback loop connected between said output terminal and said second input terminal, said second feedback loop including a voltage divider having first and second resistors, said second resistor being a temperature variable resistor and including a pair of electrically isolated heaters for varying the resistance of said second resistor.

3,906,382

FREQUENCY DISCRIMINATION CIRCUIT

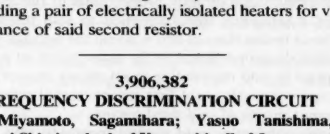
Bunichi Miyamoto, Sagamihara; Yasuo Tanishima, and Takafumi Shimizu, both of Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Aug. 6, 1974, Ser. No. 495,299

Claims priority, application Japan, Aug. 9, 1973, 48-89432

Int. Cl.[2] H03B *3/04*

U.S. Cl. 328—134 **16 Claims**



1. A frequency discrimination circuit comprising:

a mixer,

means for supplying to said mixer a first signal of a first frequency to be discriminated and a reference signal of a second frequency,

said mixer responding to said first and second signals to produce first and second beat frequency signals in phase quadrature relationship, and

a phase discrimination circuit having storing means, means for supplying to said storing means signals representative of the level conditions of the beat frequency signals during successive one-quarter time periods of each cycle of the beat frequency, said storing means storing the signals representative of a predetermined level condition of the beat frequency signals until a subsequent, predetermined level condition of said beat frequency signals representing a predetermined change in the level of at least one thereof, and

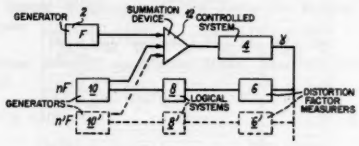
means responsive to the storage of the said predetermined level condition of said storing means in each of successive cycles of the beat frequency to provide an indication of

the extent of lead or delay of the phase of said first signal relative to that of said reference signal.

3,906,383
METHOD AND DEVICE FOR AUTOMATIC CORRECTION OF HARMONIC DISTORTION

Pierre André, Lyon; Claude Duolé, and Wladimir Stadnikoff, both of Gradignan, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 16, 1973, Ser. No. 406,837
Claims priority, application France, Oct. 27, 1972, 72.38252
Int. Cl.² H04B *15/04*
U.S. Cl. 328—163 **5 Claims**

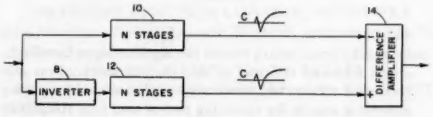


1. A method for correcting harmonic distortions of a periodic signal emitted by a system controlled by a periodic pilot signal having a frequency F, said periodic signal comprising a fundamental and harmonics, the steps of correcting separately the distortions caused by each harmonic, the cyclic correction of each harmonic comprising the steps of measuring the value of the ratio of the amplitude of the harmonic with respect to the amplitude of the fundamental and elaborating a signal H having an amplitude proportional to this ratio, elaborating a periodic signal of fixed frequency *n*F where *n* is the value of the harmonic, said elaborated periodic signal being said pilot signal, varying the phase and amplitude of the corrective signal with respect to the pilot signal with a speed of variation proportional to the value of said ratio, deriving said signal H as a derived signal H and detecting the times when said derived signal H passes from the minus sign to the plus sign, reversing the direction of the variation of said corrective signal at each of these times, said pilot signal thus elaborated producing a treated corrective signal and superimposing the treated corrective signal on the pilot signal whereby the distortions caused by each harmonic of said periodic signal are eliminated.

3,906,384
SYSTEM FOR NULLIFYING SIGNAL PROCESSOR DISTORTIONS

Murray M. Schiffman, Westport, Conn., assignor to Cambridge Research and Development Group, Westport, Conn.; Sanford D. Greenberg, Washington, D.C.; DT Liquidating Partnership, New York, N.Y. and Murray M. Schiffman, Westport, Conn.

Filed Feb. 12, 1973, Ser. No. 331,576
Int. Cl.² H03B *1/00*
U.S. Cl. 328—165 **9 Claims**

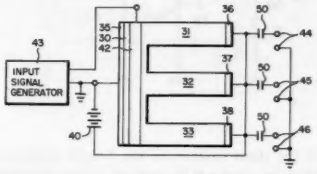


1. A signal processing circuit comprising: first and second multi-stage processing components through which said signal is serially transmitted, said first and second components each distorting said signal cumulatively through a plurality of stages in substantially the same characteristic manner; and, means interposed between said first and second components for inverting the output of said first processing component and applying the inverted output as the sole input to said second processing component to cancel the distortion introduced in said signal by said first processing component with the distortion introduced by said second processing component.

3,906,385
GUNN EFFECT POWER DIVIDER

Dale H. Claxton, Hawthorne, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 20, 1974, Ser. No. 534,603
Int. Cl.² H03F *3/04*
U.S. Cl. 330—5 **4 Claims**



1. A Gunn effect power divider comprising:
a. a substrate of semi-insulating material;
b. a semiconductive material disposed on said substrate, said semiconducting material exhibiting the Gunn effect and having differential negative resistance and capable of domain nucleation;
c. said semiconductive material having a main branch and a plurality of side branches connected thereto and disposed substantially parallel to each other and at right angles to the axis of said main branch;
d. said main branch having an ohmic electrode forming a cathode;
e. each of said side branches having an ohmic electrode at its far end forming an anode;
f. means for biasing said ohmic electrodes to create an electric field in said semiconductive material below the threshold field where domain nucleation begins;
g. a Schottky barrier electrode disposed near the cathode of said main branch and adjacent said side branches;
h. means for applying an input signal between said cathode and said Schottky electrode, said input signal having a peak amplitude sufficient together with said electric field to initiate domain nucleation, whereby a dipole domain is caused to travel through said side branches; and
i. means for deriving an output signal between each of the anodes of said side branches and said cathode, whereby amplification of said signal takes place.

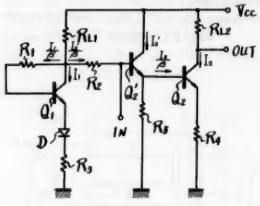
3,906,386
TRANSISTOR AMPLIFIER CIRCUITS WITH STABILIZED LOW CURRENT BIASING

Masayuki Hongu, Komae, and Isamu Ikeda, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 23, 1973, Ser. No. 363,171
Claims priority, application Japan, June 5, 1972, 47-55901
Int. Cl.² H03F *3/04*
U.S. Cl. 330—22 **4 Claims**

1. A transistor amplifier circuit comprising:
a first transistor;
a second transistor connected for supplying current bias to the first transistor;
the second transistor having its collector direct current connected to its base through a first resistor;
a third transistor connected in the emitter follower configuration;
a second resistor direct current connected between the collector of the second transistor and the base of said third transistor;

said third transistor being coupled between said second resistor and said first transistor, the ratio of the first resistor to the second resistor being greater than one, the emitters of the first and second transistors being provided with third and fourth resistors, respectively,



the ratio of the third resistor to the fourth resistor being greater than one, and a P-N junction device connected in series with the base-emitter path of said second transistor.

3,906,387

AMPLIFIER FOR HIGH-FREQUENCY SIGNALS

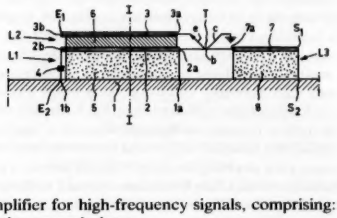
Hubert Martel, St. Germain La Blanche Herbe, and Pierre Paris, Courseulles, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1974, Ser. No. 447,556

Claims priority, application France, Mar. 2, 1973, 73.073535

Int. Cl.[2] H03F *3/04*

U.S. Cl. 330—31 **5 Claims**



1. An amplifier for high-frequency signals, comprising:

a conductive ground plate;

first and second conductors parallel to each other and parallel to said ground plate forming a first transmission line between said ground plate and said first conductor and forming a second transmission line between said first conductor and said second conductor, said first conductor shielding said second conductor from said ground plate;

a transistor mounted on said ground plate adjacent one end of said first and second conductors, said transistor having a collector in thermal and electrical contact with said ground plate and having an emitter and base one of which is electrically connected to said first conductor and the other of which is electrically connected to said second conductor;

a coupling member, which blocks direct current but has low impedance to the high-frequency electrical signals to be amplified, connecting said first conductor to said ground plate at a distance from said one end of said first conductor such that said coupling member presents a high impedance to the high-frequency electrical signals at said one end of said first conductor.

3,906,388

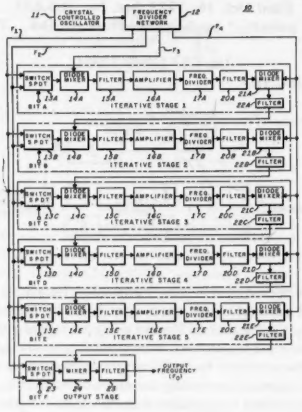
DIRECT-TYPE BINARY FREQUENCY SYNTHESIZER FOR MICROWAVE FREQUENCIES

John P. Jones, and Ronald C. Stirling, both of Clearwater, Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,271

Int. Cl.[2] H03B *21/02*

U.S. Cl. 331—39 **13 Claims**



1. A direct-type frequency synthesizer comprising

frequency generator means for providing at least four synchronized output frequency signals at four different frequencies, F_1, F_2, F_3 and F_4,

digital bit command signal means having at least first and second output terminals for providing digital command signals,

processor means having at least four input terminals coupled to corresponding output terminals on said frequency generator means and responsive to said frequencies F_1, F_2, F_3 and F_4 respectively, said processor means having a fifth input terminal coupled to said first output terminal on said digital bit command signal means and an output terminal for providing a first frequency output signal having a frequency value equal to

$$F_4 - \frac{(F_2 - F_3)}{2}$$

and a second frequency output signal having a frequency value equal to

$$F_4 - \frac{(F_1 - F_3)}{2}$$

and

output difference circuit means having four input terminals, a first terminal coupled to said output terminal on said processor means, two terminals coupled to said frequency generator means for receiving two of said four frequency signals and a fourth terminal coupled to said second output terminal on said digital bit command signal means whereby said output circuit means provides discrete frequency output signals selectable in accordance with said digital command signals from a range of synthesizer output frequency signals having a maximum frequency equal to the difference between the frequencies of the higher frequency output signal from said processor means and

the lower frequency output signal of said two of four frequency signals and having a minimum frequency equal to the difference between the frequencies of the lower frequency output signal from said processor means and the higher frequency output signal of said two of four frequency signals.

3,906,389

DIFFERENCE AMPLIFIER WITH GAIN CONTROLLED BY THE SUM OF THE INPUTS

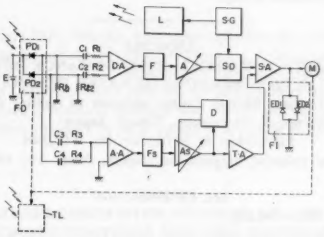
Seiichi Matsumoto, Tokyo, and Kazuya Hosoe, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1973, Ser. No. 344,725

Claims priority, application Japan, Mar. 29, 1972, 47-31342

Int. Cl.[2] G03B *13/18;* **H03F** *17/00*

U.S. Cl. 330—59 **6 Claims**



1. In a comparator circuit:

first light sensitive means comprising first and second photoelectric elements;

first means for detecting the difference between the outputs of the first and second photoelectric elements of the first light sensitive means;

second means for detecting the sum of the outputs of the first and second photoelectric elements of the first light sensitive means;

variable-gain amplifier means;

means for coupling the output of the first detecting means to the input of the variable-gain amplifier means; and

means responsive to the output of the second detecting means for varying the gain of the variable-gain amplifier means by an amount determined by, and in a direction opposite from variations in the output of the second detecting means.

3,906,390

TRANSFER FUNCTION CONTROL NETWORKS

John Mortimer Rollett, London, England, assignor to The Post Office, London, England

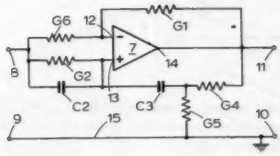
Filed Oct. 23, 1974, Ser. No. 517,147

Claims priority, application United Kingdom, Oct. 26, 1973, 49974/73

Int. Cl.[2] H03F *1/36*

U.S. Cl. 330—107 **7 Claims**

1. A transfer function control network comprising a differential input operational amplifier having an inverting input, a non-inverting input and an output, and having a high gain A; a first element having an admittance Y_1 and connected between the said output and the inverting input of the amplifier; a second element having an admittance Y_2 and connected between a signal input terminal and the non-inverting input of the amplifier; a third element having an admittance Y_3 and a fourth element having an admittance Y_4 connected in series between the non-inverting input and the output of the amplifier; a fifth element having an admittance Y_5 and connected between a reference terminal and the junction between the third and fourth elements; and a sixth element having an



admittance Y_6 and connected between the signal input terminal and the inverting input terminal of the amplifier, the arrangement being such that when an input signal V_i is applied between the signal input terminal and the reference terminal an output signal V_o is derived from between the output of the amplifier and the reference terminal so that the transfer function:

$$\frac{V_o}{V_i} = \frac{Y_1Y_2(Y_3 + Y_4 + Y_5) - Y_6Y_4(Y_4 + Y_5)}{Y_1Y_2(Y_3 + Y_4 + Y_5) + Y_1Y_3Y_5 - Y_2Y_4Y_6 + E/A}$$

where, to a first approximation:

$$\frac{E}{A} = (Y_1 + Y_6)\left\{Y_2(Y_3 + Y_4 + Y_5) + Y_3(Y_4 + Y_5)\right\}\left[\frac{1}{A_o} + \frac{s}{2\pi f_T}\right]$$

and where:

s is the complex frequency variable;

A_o is the d.c. gain of the amplifier at very low frequencies; and

f_T is characteristic of the frequency performance of the amplifier, that is to say, the gain-bandwidth product of the amplifier.

3,906,391

LINEAR PERIOD THERMISTOR TEMPERATURE OSCILLATOR

Lawrence C. Murdock, Bellevue, Wash., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1974, Ser. No. 479,390

Int. Cl.[2] G01K *7/24;* **H03K** *3/02*

U.S. Cl. 331—66 **4 Claims**

1. A linear period thermistor oscillator comprising:

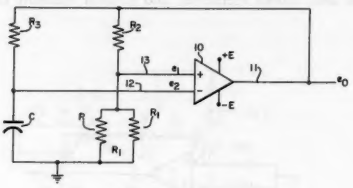
a. an amplifier including first and second inputs and an output and being of the type which provides an output signal which switches between relatively positive and negative output values depending upon the relative magnitude of signals applied to said first and second inputs;

b. first and second feedback paths respectively connecting said output with said first and second inputs;

c. said first feedback path including a circuit of the type which, in response to said output signal, provides a non-

linear output signal, said non-linear output signal being applied to said first input;

d. said second feedback path including a voltage divider network;



e. a thermistor having a resistance which varies non-linearly with temperature, connected as an element in said voltage divider network.

3,906,392

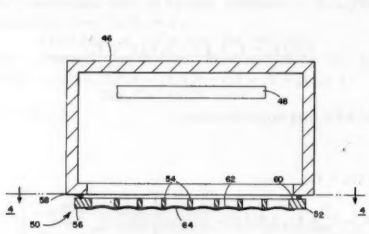
COMBINATION ELECTRON WINDOW-SUSTAINER ELECTRODE FOR ELECTRON BEAM DISCHARGE DEVICES

Michael M. Mann, Palos Verdes Estates, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jan. 7, 1974, Ser. No. 431,353

Int. Cl.[2] H01S *3/22, 3/07*

U.S. Cl. 331—94.5 G 12 Claims



1. An electron beam stabilized electrical discharge gas laser comprising a vessel, means for introducing a laser gas under pressure into saiad vessel, electron accelerator means supported on said vessel for introducing a higher energy primary electron beam into said vessel, an integral first sustainer electrode and electron stream window combination structure located in the path of the electron beam of said accelerating means, said structure being positioned out of the main laser gas stream so as to minimize interference thereby with laser gas flow, and a second sustainer electrode spaced from said combination structure and cooperating therewith to establish a sustainer field electron stream thereacross.

3,906,393

ACOUSTICALLY CONTROLLED DISTRIBUTED FEEDBACK LASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles Elachi, Pasadena, Calif.

Filed June 28, 1973, Ser. No. 374,423

Int. Cl.[2] H01S *3/10*

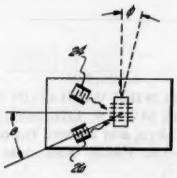
U.S. Cl. 331—94.5 C 8 Claims

1. A distributed feedback laser including:

a substrate having a planar surface;

a lasing medium mounted on said planar surface of said substrate;

acoustic means positioned on said planar surface of said substrate in proximity to said lasing medium for providing acoustic energy that is propagated between the abutting surfaces of said lasing medium and said substrate to produce mechanical distortion of said lasing medium said acoustic means including a pair of acoustic transducers positioned to have the acoustic waves generated thereby



cross-directed to form an interference pattern wherein said interference pattern produces mechanical distortion of said lasing medium; and

means for applying excitation energy to said lasing medium to produce lasing.

3,906,394

APPARATUS FOR REGULATING DISTANCE BETWEEN REFLECTION MIRRORS OF LASER RESONATOR

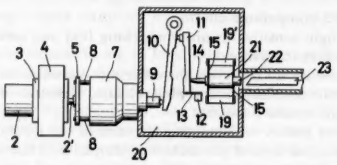
Keiichi Tanaka, Kiyose, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,544

Claims priority, application Japan, Mar. 14, 1973, 48-29029

Int. Cl. H01s *3/08*

U.S. Cl. 331—94.5 C 4 Claims



1. An apparatus for regulating distance between reflection mirrors of a laser resonator, comprising in combination, a rotational means driven by an error signal obtainable from a frequency variation of laser beam, means for converting the rotational movement of said rotational means to a linear movement, means for reducing the linear movement of said converting means to a fine linear movement and means for transmitting the fine linear movement to one of said mirrors.

3,906,395

OPTICAL MOLECULAR AMPLIFYER

Karl L. Kompa; Peter Gensel, and Jochen Wanner, all of Meiserstrasse 1, 8 Munich 2, Germany

Filed Mar. 17, 1971, Ser. No. 125,082

Claims priority, application Germany, Mar. 26, 1970, 201493

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 G 13 Claims

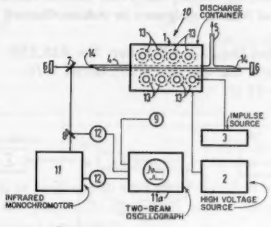
1. An optical molecular amplifier comprising:

a container means for a reactive chemical mixture,

a flash impulse means operatively associated with said container means for supplying a flash impulse thereto,

reflector means positioned along the axes of said container means at opposite ends thereof to define a laser resonator, and

a reactive chemical mixture in said container means comprised of a mixture of a material selected from the group consisting essentially of hydrogen, a hydrogen compound, deuterium, a deuterium compound, and mixtures thereof and a photolizable fluoride compound of the general



formula MF_n wherein M is selected from the group consisting essentially of chlorine, bromine, iodine, sulfur and nitrogen and n is a whole integer, whereby the flash impulse triggers a chain reaction of said reactive mixture to produce a reaction product and energy for pumping the reaction product so as to produce a coherent light.

3,906,396

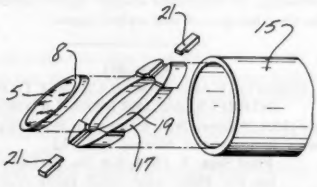
GLASS LASER DISCS WITH ANNULAR ALKALI LEAD BORATE COATINGS AND USES THEREOF

Richard F. Cooley, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 332,057, Feb. 13, 1973. This application Oct. 15, 1974, Ser. No. 512,584

Int. Cl.² H01S *3/02*

U.S. Cl. 331—94.5 D **2 Claims**



1. The new use of a glass coating for a glass laser disc having an annular alkali lead borate glass coating, the new use comprising the steps of:

a. coating the glass laser disc with an alkali lead borated glass containing an effective energy-absorbing amount of a heavy metal oxide that absorbs energy at a wavelength of about 1.06 microns to provide an annular coating on the disc;

b. pumping the disc to cause an energy inversion; and

c. passing monochromatic light through the disc to cause stimulated emission and absorbing energy at a wavelength of 1.06 microns in the annular glass coating to thereby prevent parasitic oscillations.

3,906,397

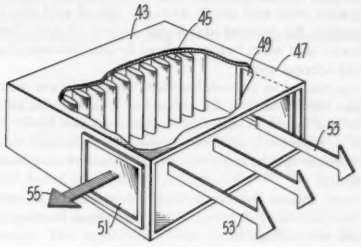
DIATOMIC INFRARED GASDYNAMIC LASER

Robert L. McKenzie, Sunnyvale, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 26, 1971, Ser. No. 137,391

Int. Cl.² H01S *3/00*

U.S. Cl. 331—94.5 G **8 Claims**



1. In a gasdynamic laser wherein a hot, high pressure gas is discharged through an expansion nozzle and laser action is solely initiated by a thermal expansion of the laser media between mirrors in said nozzle, the improvement comprising utilizing as a gas mixture at least two gases, the first of which is a suitable infrared-active diatomic gas consisting essentially of carbon monoxide and the second of which is a suitable pumping gas consisting essentially of nitrogen, wherein the amount of carbon monoxide ranges from 1 to 80 percent by volume of said gas mixture.

3,906,398

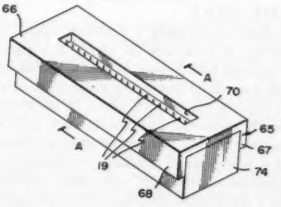
INERT GAS METALLIC VAPOR LASER

George M. Low, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Gary R. Russell, Sierra Madre; Noble M. Nerheim, Arcadia, and Thomas J. Pivirotto, Sierra Madre, all of Calif.

Filed Dec. 3, 1973, Ser. No. 420,813

Int. Cl. H01s *3/22, 3/06*

U.S. Cl. 331—94.5 G **10 Claims**



1. A laser comprising:

first means adapted to receive at least one inert gas and metallic matter for producing a mixture definable as a gaseous lasant comprising of said inert gas and metallic vapor;

a laser chamber;

a pair of mirrors positioned in said laser chamber in two parallel mirror planes and spaced apart along an axis defining a cavity axis;

first and second electrodes each including current discharge means spaced apart from one another and from said cavity axis in said laser chamber, the current discharge means of each of said electrodes being aligned in an imaginary plane including said cavity axis which is perpendicular to the mirror's planes with the current dis-

charge means of said electrodes equidistantly spaced from said cavity axis on opposite sides thereof, and together with said mirrors defining a laser cavity, at least said first electrode being comb-shaped and comprising a plurality of electrically conductive wires, each having a first end electrically connected to a common terminal and a second end defining an exposed wire tip, and means for holding portions of said wires so the exposed wire tips are equidistantly spaced from one another in a direction parallel to said cavity axis, with all the tips equidistantly spaced from said cavity axis, the tips of said wires representing the current discharge means of said first electrode, said wires being of equal length between their first and second ends;

nozzle means in communication with said first means and said laser chamber for providing a communication path for the lasant in said first means into said laser chamber in a direction, whereby some lasant enters said laser chamber and at least some of it passes through said laser cavity;

vacuum means for controlling the pressure in said laser chamber and for withdrawing the lasant passing through said laser chamber;

a first electrode cover member having a top side, facing said second electrode and defining a slot in said top side, with all the tips of the wires of said first electrode being exposed to said second electrode through said slot, said tips being recessed below the tip side of said member to protect the tips from direct exposure in the path of the lasant passing through said laser cavity, said first cover member being of a material which exhibits high resistance to thermal shock; and

power means coupled to said common terminal of said first electrode and to said second electrode for applying a current pulse to said electrodes when lasant passes through the laser cavity.

3,906,399

BROAD BAND EXCIPLEX DYE LASERS

Andrew Dienes, Middletown; Charles Vernon Shank, Holmdel, and Anthony Marion Trozzolo, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 37,882, May 15, 1970, abandoned. This application Nov. 9, 1972, Ser. No. 305,131

Int. Cl. H01s *3/20*

U.S. Cl. 331—94.5 L **2 Claims**

1. Dye laser comprising a resonant cavity defined by two end members at least one of which is a partially reflecting member through which laser output is transmitted, said cavity containing a medium consisting essentially of a solution of at least two ingredients, one of which in its unmodified state is electronically excitable to a lasing state and at least one of which reacts with the first mentioned ingredient in its electronically active state to produce an exciplex capable of producing stimulated emission, said laser including means for producing a population inversion therein together with means coupled to said medium for stimulating the emission of a coherent beam of radiation from said population inverted medium, characterized in that the peak emission wavelength of the said ingredient in its unmodified electronically active state and the peak emission wavelength of the said exciplex are separated by a wavelength change of at least 500 Angstrom units, and in which the said partially reflecting member is partially reflecting over a bandwidth including the peak emission wavelength of the said exciplex, in which one ingredient is an electron acceptor, and in which a second ingredient is an electron donor, and in which the said electron acceptor is selected from the group consisting of unsubstituted polycyclic aromatic hydrocarbons containing from 2 to 5 rings as well as monoalkyl, dialkyl and monochloro derivatives thereof, and the electron donor is selected from the group consisting of tertiary amines selected from the group consisting of X—N—Y_2 and Y_2N—Z—NY_2 where X is phenyl or naphthyl, Y is an alkyl grouping and Z is phenylene, naphthylene or biphenylene so as to transmit laser output over such bandwidth.

3,906,400

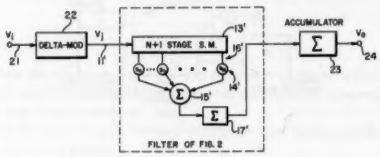
TRANSFER FUNCTION REALIZATION WITH ONE-BIT COEFFICIENTS

Dennis Jay Gooding, Acton, and Peter Holden Anderson, Sudbury, both of Mass., assignors to Adams-Russell Co., Waltham, Mass.

Filed Dec. 17, 1973, Ser. No. 425,250

Int. Cl.² H03R *13/22*; **H03H** *7/10*

U.S. Cl. 332—11 D **7 Claims**



1. Non-recursive filtering a apparatus for establishing a predetermined transfer characteristic between an input terminal and an output terminal comprising,

a plurality of output taps,

delay means for furnishing a predetermined delay to a signal applied to said input terminal between said input terminal and each of said taps,

a gain control unit associated with each of said taps for transmitting the signal associated with the associated tap with gain of substantially constant amplitude and a selected one of positive and negative polarities,

said gain of substantially constant amplitude being the same for each gain control unit,

means for cumulatively combining the outputs from each of said gain control units to provide an output signal on said output terminal corresponding to said input signal applied to said input terminal modified in accordance with the transfer characteristic determined by said delay means, said gain control units and said means for cumulatively combining,

and integrating means responsive to said output signal for providing an integrated output signal representative of the time integral of said output signal.

3,906,401

FEEDFORWARD ERROR CORRECTION IN INTERFEROMETER MODULATORS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1974, Ser. No. 502,453

Int. Cl.² H03C *1/06*, *3/08*; **H03F** *1/26*

U.S. Cl. 332—18 **2 Claims**

1. In a interferometer type amplitude modulator incuding:

an input hybrid coupler;

an output hybrid coupler;

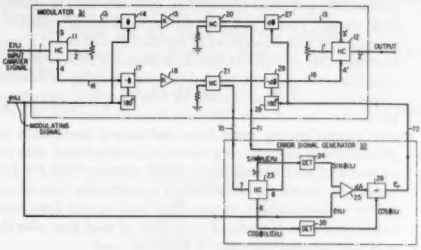
and first and second wavepaths, each of which includes a signal phase modulator, for connecting a pair of conjugate branches of said input coupler to a pair of conjugate branches of said output coupler;

the improvements comprising:

first and second coupling means for extracting a portion of the phase modulated carrier signal derived from each of said phase modulators;

means, utilizing said signal portions, for generating an error signal proportional to the difference between the amplitude of the sum of said signal components and the amplitude of the input modulation signal divided by the cosine of the phase modulation produced by said modulators;

and error correcting phase modulation means located along said wavepaths for phase modulating each of said derived



signals in response to said error signal in a sense to minimize the amplitude distortion in the output signal from said output coupler.

3,906,402

LIQUID COOLED DUMMY LOAD FOR RF TRANSMISSION LINE

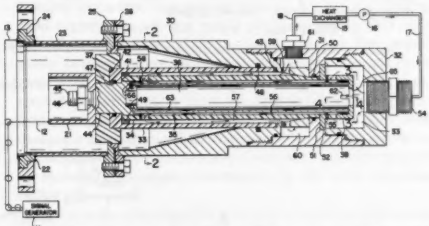
Leo Lesyk, Walton Hills, Ohio, assignor to Bird Electronic Corporation, Solon, Ohio

Continuation-in-part of Ser. No. 417,104, Nov. 19, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,724

Claims priority, application Canada, Oct. 25, 1974, 212346; Germany, Nov. 14, 1974, 2453962; United Kingdom, Nov. 19, 1974, 50103/74

Int. Cl.[2] H01P *1/26*

U.S. Cl. 333—22 F **3 Claims**



1. A liquid cooled dummy load device for an RF coaxial transmission line, the device having a connector with first and second contact means for the inner and outer coaxial conductors respectively, and a cylindrical housing;

an elongated tubular dielectric member coaxially mounted in said housing,

a thin resistive film deposited on the outer surface of said dielectric member and series connected between said first and second contact means, said film being adapted to convert electrical energy being transmitted by said transmission line to heat energy,

means defining a liquid inlet, and a liquid outlet at one end of said housing,

a first cylindrical sleeve member formed of low friction insulating material surrounding and coaxial with said tubular dielectric member and defining with said thin resistive film an inner annular cylindrical liquid flow passage communicating with said liquid inlet,

a second cylindrical sleeve member formed of low friction insulating material surrounding and coaxial with said first cylindrical sleeve member and defining with the outer surface of said first cylindrical sleeve member an outer annular liquid flow passage communicating with said liquid outlet, said second cylindrical sleeve member defining with said housing an exponential horn chamber adapted to contain an air medium for minimizing the reflected energy from said termination,

means defining radial ports connecting said inner liquid flow passage to said outer liquid flow passage at the ends thereof opposite said inlet and outlet,

whereby liquid flowing in said inner flow passage absorbs heat energy from said resistive film,

means defining a liquid chamber within said tubular dielectric member and communicating with said liquid inlet to provide a liquid dielectric medium within said tubular dielectric member, and

means for pumping cooling liquid through said passages.

3,906,403

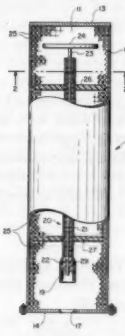
IMPEDANCE SIMULATOR FOR SIMULATING THE IMPEDANCE OF AN ANTENNA RADIATING IN AN OPEN SPACE OVER A SELECTED FREQUENCY BAND

Watson P. Czerwinski, Forked River, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 446,831, Feb. 24, 1974, abandoned. This application Mar. 5, 1975, Ser. No. 555,502

Int. Cl.[2] H01P *1/26*

U.S. Cl. 333—22 R **3 Claims**



1. An impedance simulator for simulating the impedance of a whip antenna in open space over a selected frequency band comprising:

a coaxial conductor having an outer conductor and an inner conductor, said inner conductor having an exposed portion extending beyond one end of said outer conductor; a conductive disk mounted on the end of said exposed portion of said inner conductor, said conductive disk lying in a plane transverse to the axis of said coaxial conductor; and

a shield formed from a conductive material spaced from and substantially surrounding said coaxial conductor and said conductive disk, a substantial area of the interior surface of said shield being coated with a ferrite material.

3,906,404

FERRITE POWER LIMITER COMPRISING SYNCHRONOUSLY TUNED, RESONANT CAVITIES

Samuel Dixon, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

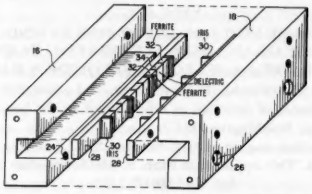
Filed Feb. 25, 1974, Ser. No. 445,737

Int. Cl. H01p *1/00, 1/22*

U.S. Cl. 333—17 **1 Claim**

1. A broadband ferrite limiter for connection between two rectangular waveguide transmission line sections for the frequency range 16–17 GHz comprising a pair of complementary channel-like housing members contiguous with each other so

as to form a rectangular waveguide, a flat bar secured in the bight of each channel-like housing member, the widths of the bars and of the channels in the housing members being the same, several symmetrical iris means secured along the lengths of the bars to define a plurality of resonant cavities between iris means in the 16–17 GHz frequency range, at least two rectangular ferrite rods affixed normal to one face of one of said bars between each pair of successive iris means, every two successive ferrite rods between successive iris means sandwiching and separated by a nonmagnetic dielectric rod, the ferrite rods including single crystal YIG rods and single crystal lithium ferrite rods, all of said rods having substantially



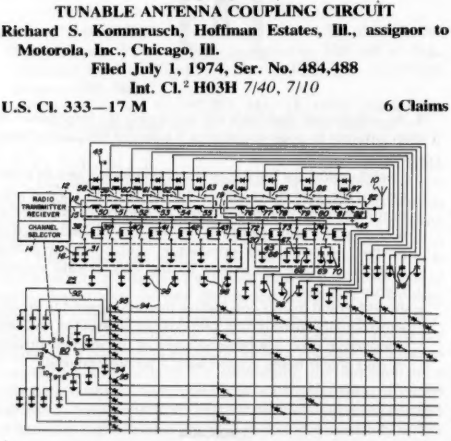
the same dimensions and the same dielectric constant, whereby in the presence of a dc magnetic field of 2000–3000 gauss the limiting threshold is low because of the combined effects of RF magnetic field intensity in the cavities and the nonmagnetic separator rods that direct more of the magnetic flux through the ferrite and whereby any propagated signal within the frequency range that exceeds critical power level is limited to critical power level and any propagated signal within the frequency range that does not exceed the critical power level is substantially unattenuated even when signals that exceed critical power level and signals that do not exceed critical power level but differing in frequency are substantially time coincident.

3,906,405

TUNABLE ANTENNA COUPLING CIRCUIT

Richard S. Kommrusch, Hoffman Estates, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed July 1, 1974, Ser. No. 484,488
Int. Cl.[2] H03H *7/40, 7/10*
U.S. Cl. 333—17 M **6 Claims**



1. A tunable coupling circuit for applying signals of different frequencies between a first signal translating device and a second signal translating device for matching the impedance of the translating devices and efficiently coupling signals therebetween, such coupling circuit including in combination,

a series circuit connected between the first and second translating devices and including a plurality of inductance coil sections connected in series,

a shunt circuit connected between said series circuit and a reference potential and including a plurality of capacitors,

switch means including a first plurality of switches having contacts individually connected across said coil sections for selectively shunting said coil sections in said series circuit and a second plurality of switches having contacts individually connected to said capacitors for selectively connecting said capacitors in parallel in said shunt circuit, a certain one or more of said first plurality of switches and a certain one or more of said second plurality of switches when actuated effect tuning of said coupling circuit to a particular one of said different frequencies,

matrix means having input lines and output lines, each one of said input lines having one-way connections with one or more of said output lines, which connections for each input line being associated with a particular one of said different frequencies, one each of said output lines being connected to a respective one each of said first plurality and said second plurality of switches, and

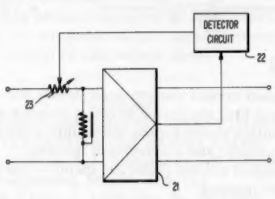
selector means for tuning the coupling circuit to one of said different frequencies, said selector means including a plurality of conductors, each one of said conductors being associated with a particular one of said different frequencies, the conductor of said selector means associated with a particular one of said different frequencies being connected to the input conductor of said matrix means for that same frequency, and means for selectively connecting one of said plurality of conductors to a given potential for defining a circuit through said selector and the circuit of said matrix to those switches of said first plurality of switches and said second plurality of switches associated with the particular frequency.

3,906,406

TWO-PORT NETWORK FOR SIGNAL TRANSMISSION EQUALIZATION

Takuya Iwakami, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,772
Claims priority, application Japan, Feb. 9, 1973, 48-16842
Int. Cl.[2] H03H *7/06, 7/16, 13/00*
U.S. Cl. 333—18 **10 Claims**



1. A two-port network comprising:

an input port;

an output port, one terminal of said output port being directly connected to one terminal of said input port;

a lumped resistive element connected between the other terminal of said input port and the other terminal of said output port; and

a single one-port uniformly-distributed RC network connected between said terminals of said output port, whereby the voltage transfer function of said two-port network being given by $1/(1+R/Z(S))$, $(S=j\omega)$, where ω designates angular frequency; j, -1; R, the resistance of said lumped resistive element; and Z(S), the one-port impedance of said single one-port uniformly-distributed RC network.

3,906,407

ROTARY WAVE-GUIDE STRUCTURE INCLUDING POLARIZATION CONVERTERS

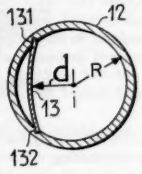
Claude Levaillant, and Andre' Bensussan, both of Paris, France, assignors to CGR-Mev, Paris, France

Filed Jan. 11, 1974, Ser. No. 432,689

Claims priority, application France, Jan. 16, 1973, 73.01455

Int. Cl. H01p *1/15, 1/16*

U.S. Cl. 333—21 A **10 Claims**



1. In a waveguide structure for converting linearly polarized microwaves into circularly polarized microwaves and vice versa, in combination:

a first and a second waveguide of circular cross-section centered on a common axis;

joint means between said first and second waveguides enagling relative rotation thereof about said axis with uninterrupted microwave transmission therebetween;

input waveguide means of rectangular cross-section connected to said first waveguide for supplying same with linearly polarized microwave energy having an electric field vector in a first radial plane including said axis;

output waveguide means of rectangular cross-section connected to said second waveguide for extracting therefrom linearly polarized microwave energy having an electric field vector in a second radial plane including said axis;

first inductive phase-shifting means in said first waveguide comprising a first plurality of axially spaced elongate conductive elements of arcuate configuration connected at their ends to the inner peripheral surface of said first waveguide and spaced therefrom between said ends thereof while turning their concave sides toward said axis, a line spanning the ends of any element of said first plurality including an angle of substantially 45° with said first radial plane; and

second inductive phase-shifting means in said second waveguide comprising a second plurality of axially spaced elongate conductive elements of arcuate configuration connected at their ends to the inner peripheral surface of said second waveguide and spaced therefrom between said ends thereof while turning their concave sides toward said axis, a line spanning the ends of any element of said second plurality including an angle of substantially 45° with the said second radial plane.

3,906,408

FREQUENCY TRANSLATOR USING GYROMAGNETIC MATERIAL

Wieslaw Wojciech Siekanowicz, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,242

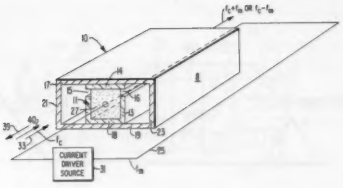
Int. Cl.² H01P *1/40;* **H02M** *5/02*

U.S. Cl. 333—24.1 **6 Claims**

1. A translator for providing a frequency deviation of radio frequency signals in accordance with a modulating signal comprising:

a waveguide having a toroid of gyromagnetic material extending along a length of the waveguide, said toroid having at least one demagnetizing gap along the length of said toroid,

said waveguide being dimensioned to support given radio frequency signals propagated along said waveguide,



means for applying a sawtooth current through said toroid to translate according to said current the frequency of said given signals.

3,906,409

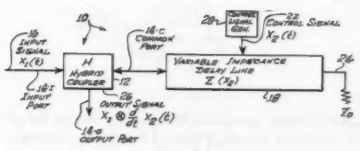
VARIABLE IMPEDANCE DELAY LINE CORRELATOR

Harper John Whitehouse, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,560

Int. Cl.² H03H *7/36, 9/30, 9/28;* **G06F** *15/34*

U.S. Cl. 333—29 **6 Claims**



GENERAL CONFIGURATION OF THE VARIABLE-IMPEDANCE DELAY LINE CORRELATOR.

1. A variable-impedance delay-line correlator comprising:

a hybrid coupler, having an input port, a common port and an output port, at the input port of which may be applied an arbitrary input signal $X_1(t)$;

a variable impedance delay line, whose input is connected to the common port of the hybrid coupler, the delay line also being connectable to an input control signal $X_2(t)$ of variable amplitude, the output of the delay line being terminated in its nominal characteristic impedance Z_0;

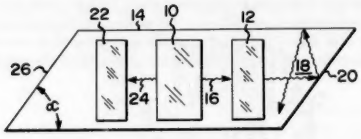
the delay line comprising a set of elements having relative values of reactance such that, with an arbitrary input signal $X_1(t)$ and with the control signal $X_2(t)$ varying in magnitude and in steps and at uniformly spaced times Y_j which satisfy the sampling theorem for $X_2(t)$, the output signal at the output port of the delay line will be $X_1(t) \otimes (d/dt)\ X_2(t)$, where the symbol $\otimes$ indicates the correlation of the input signal $X_1(t)$ with the derivative of the control signal $X_2(t)$.

3,906,410

SURFACE WAVE DEVICE AND METHOD OF MAKING

G. Norman Williams, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 26, 1974, Ser. No. 492,193
Int. Cl.[2] H03H 9/30; H01L 41/10, 41/18
U.S. Cl. 333—30 R 8 Claims



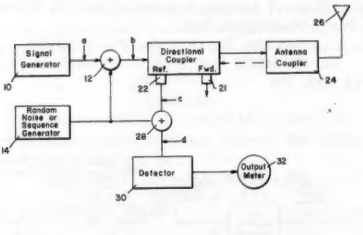
1. A surface wave device having at least one interdigital transducer disposed on a substrate of lithium niobate having a first pair of edges coincident with (0001) planes and a second pair of edges coincident with planes selected from one of the [1012], [10$\bar{1}$2], and [1210] families of planes.

3,906,411

ANTENNA TUNING APPARATUS

Harold V. Lind, Santa Ana, and Gary D. Frey, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 4, 1974, Ser. No. 520,387
Int. Cl.[2] G01R 27/06; H04B 17/00; H01P 5/18
U.S. Cl. 333—32 15 Claims



1. An antenna apparatus comprising means for providing a carrier signal of a predetermined frequency; means for providing a random noise signal; means responsive to said carrier signal and said random noise signal for phase modulating said carrier signal with said random noise signal; antenna means capable of being tuned to said predetermined frequency; means including a directional coupler having an input terminal responsive to said phase modulated carrier signal, a load output terminal connected to said antenna means and a reflected signal output terminal for making available thereat electrical signal energy reflected from said antenna means; means for providing a local oscillator signal of a frequency different than said predetermined frequency; means responsive to said local oscillator signal and said random noise signal for phase modulating said random noise signal with said local oscillator signal; means responsive to said electrical signal energy reflected from said antenna means and said phase modulated random noise signal for phase modulating said electrical signal energy reflected from said antenna means with said phase modulated random noise signal thereby to produce a signal of substantially one frequency equal to the difference between said predetermined frequency and that of local oscillator and of an amplitude proportional to said electrical signal energy reflected from said antenna means; and means responsive to said signal of substantially one frequency for determining said amplitude whereby said antenna means can be tuned to minimize said amplitude.

3,906,412

AC SUPERCONDUCTING ARTICLES AND A METHOD FOR THEIR MANUFACTURE

Robert W. Meyerhoff, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 160,926, July 8, 1971, which is a continuation of Ser. No. 701,594, Jan. 30, 1968, abandoned. This application May 11, 1973, Ser. No. 359,377
Int. Cl. H01p 11/00, 7/06
U.S. Cl. 333—83 R 2 Claims

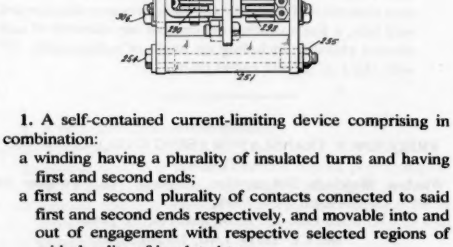
1. A superconducting RF cavity for continuously propagating or sustaining an alternating electromagnetic field at high power density with extremely low AC losses comprising: a hollow thermally conductive supporting structure of predetermined thickness forming the outer surface of said cavity, said structure having at least one open end; a relatively thin coating of ultra-high pure niobium bonded to the inner surface of said structure; and an equally relatively thin coating of ultra-high pure niobium bonded to the open surface of said structure and having an exposed surface roughness of less than five micro-inches RMS whereby very high RF power densities are obtainable with very low AC power losses.

3,906,413

CURRENT-LIMITING DEVICE FOR LOW-VOLTAGE ELECTRICAL POWER SYSTEMS

Challis I. Clausing, Marlton, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Continuation-in-part of Ser. No. 390,064, Aug. 20, 1973, Pat. No. 3,836,819. This application Sept. 13, 1974, Ser. No. 505,792
Int. Cl.[2] H01H 77/06
U.S. Cl. 335—41 25 Claims



1. A self-contained current-limiting device comprising in combination:

a winding having a plurality of insulated turns and having first and second ends;

a first and second plurality of contacts connected to said first and second ends respectively, and movable into and out of engagement with respective selected regions of said plurality of insulated turns;

first and second extending terminals for said device;

said first plurality of contacts connected to said first terminal; said second plurality of contacts connected to said second terminal;

biasing means for biasing each contact of said first and second plurality of contacts into engagement with said selected regions of said turns, whereby a current path is

formed essentially laterally through said plurality of turns, whereby the inductance of said plurality of turns is not connected between said first and second terminals;

operating means for moving at least selected contacts of said first and second plurality of contacts to a disengaged position relative to said selected regions when the current flow between said first and second terminals exceeds a predetermined value; and

latch means for latching said contacts in a disengaged position after their movement thereto.

3,906,414
ELECTRIC CIRCUIT BREAKERS

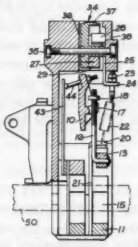
Alan Lister Kidd, Southport; Douglas Eaves, Blackpool, and Keith Walmsley, Preston, all of England, assignors to Dorman Smith Switchgear Limited, Preston, England

Filed Sept. 12, 1974, Ser. No. 505,224

Claims priority, application United Kingdom, Oct. 4, 1973, 46292/73

Int. Cl.² H01H *69/01*

U.S. Cl. 335—42 **4 Claims**



1. An electric circuit breaker of the type which includes a pivoted armature forming part of an electromagnetic circuit through which a conductor extends so that a short circuit current passing through the conductor causes pivoting of the armature by reason of magnetism induced in the electromagnetic circuit by such current, the armature's movement serving to cause movement of a trip bar of the circuit breaker, whereby the latter is tripped, and in which pivoting movement of the pivoted armature occurs against the action of a resilient member loading the armature, characterized in that the load applied by said resilient member is variable by adjustment of an eccentric boss rotatable manually by means of a knob accessible externally of the circuit breaker, the knob being shaped to provide a recess in which the boss is secured, and wherein the securement of the boss to the knob is adjustable for the eccentricity of the boss to be varied thereby to vary the extent of adjustment which is achieved by rotating the knob.

3,906,415
APPARATUS WHEREIN A SEGMENTED FLUID STREAM PERFORMS ELECTRICAL SWITCHING FUNCTIONS AND THE LIKE

Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 14, 1974, Ser. No. 479,244

Int. Cl.² H01H *29/24*

U.S. Cl. 335—47 **66 Claims**

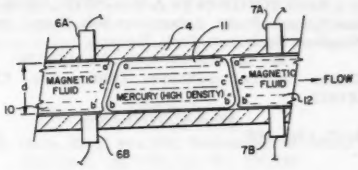
1. A fluid switch for switching electric current that comprises, in combination:

a tube of an electrically non-conductive material;

contiguous regions within the tube having respectively a liquid electrical conducting material and a fluid insulating material, said regions being disposed axially along the tube, there being a stable transverse interface between the two materials at said regions;

a plurality of electrodes in contact with the liquid electrical conducting material and the fluid insulating material; and

means for propelling the liquid electrically conducting material and the fluid insulating material to cause the liquid electrical conducting material and the fluid insulating material to move axially relative to the electrodes, thereby to permit electric currents to flow between the electrodes and to be interrupted depending upon whether the liquid electrical conducting material or the fluid insulating material, respectively, is positioned between the electrodes, the axial movement of the liquid electrical conducting material and the fluid insulating material being always in the same directional sense of flow; the interior cross dimensions of the tube being large enough to render insignificant axial forces due to capillary action therein between the tube and either the liquid electrical conducting material or the fluid insulating material.



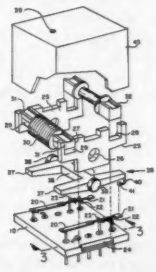
3,906,416
ELECTRICAL RELAY

Anthony E. Sprando, 3115 N.W. Cornell Rd., Portland, Oreg. 97210

Filed Nov. 12, 1973, Ser. No. 414,919

Int. Cl.² H01H *45/02*

U.S. Cl. 335—128 **12 Claims**



1. An electromagnetic relay comprising:

a base plate of insulating material having pin means mounted therein at insulative spaced intervals;

stationary contact means provided on first and second of said pin means;

movable contact means mounted on third pin means and in engagement with said stationary contact means on said first pin means;

frame means provided by said base plate;

armature means of magnetizable material pivotally mounted to said frame means through an axial cross member thereof and radial arm means extending outwardly from opposite sides of said axial cross member in one plane which is substantially parallel to said base plate and which moves about a pivot axis extending through said cross member;

electromagnetic means mounted on said frame means adjacent at least said radial arm means that extend from one side of said axial cross member; and

actuating means provided on said radial arm means, said actuating means engaging said movable contact means

and moving said movable contact means from said first contact means to said second contact means upon energization of said electromagnetic means.

3,906,417

PUSH-BUTTON WITH MULTIPLE ELECTROCONDUCTIVE CONTACTS RETURNED TO REST POSITION BY A MAGNETIC DEVICE

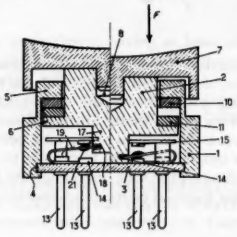
Edouard Serras-Paulet, Aulnay-sous-Bois, France, assignor to Neophone Equipment, Paris, France

Filed Jan. 10, 1974, Ser. No. 432,336

Claims priority, application France, Jan. 12, 1973, 73.01053

Int. Cl.[2] H01H *36/00*

U.S. Cl. 335—205 **10 Claims**



1. Control device for the switching of at least one electric circuit, comprising a casing provided with a plurality of stationary connecting terminals, stationary and movable contact elements and contact reeds, a push-button which is movable by pressing its external end through an opening of a panel of the casing between abutments of the casing defining two positions corresponding respectively to two distinct switching states of the said electric circuit, said movable contact elements and contact reeds adapted to be moved by said push-button, the said casing being closed at its end opposite to the said opening by a detachably fastened plate of insulating material, said plurality of stationary connecting terminals, stationary and movable contact elements and contact reeds being all mounted on said plate and supported thereby, said contact reeds being further drivingly secured to the said push-button, the latter being provided in its portion located within the said casing with a ring of magnetic material cooperating with at least one permanent magnet solid with the said casing to form magnetic return means acting upon said push-button, the maximum air-gap between the said permanent magnet and the said ring of magnetic material being equal to the distance between the said two switching positions of the said push-button.

3,906,418

MEANS FOR EFFECTING DYNAMIC VERTICAL CONVERGENCE IN AN IN-LINE PLURAL BEAM CATHODE RAY TUBE

Chandra P Doshi, Seneca Falls, and Lawrence W. Pridmore, Elba, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 14, 1974, Ser. No. 497,278

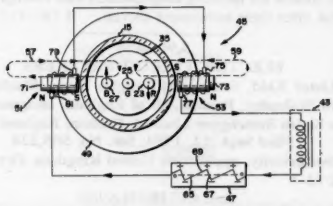
Int. Cl.[2] H01F *7/00*

U.S. Cl. 335—210 **4 Claims**

1. An improvement in the means for effecting dynamic vertical convergence of a plurality of related electron beams as operationally manifest in the raster of the screen display of a three in-line beam color cathode ray tube employing a deflection yoke having vertical and horizontal deflection windings wherein at least part of the dynamic convergence of said beams is accomplished by the utilization of said yoke, said improvement being an auxiliary fine-adjustment convergence means comprising:

a non-magnetic supporting element formed for positioning on the exterior of the neck portion of said tube; and

a pair of series connected individually adjustable helix-wound coils mounted on said supporting element in the plane of said in-line beams in a manner that one of said



coils is substantially adjacent each of the outside beams of said in-line arrangement, said coils being series connected to the operational vertical output circuit and the vertical windings of said yoke to provide adjustable coupling of the magnetic fields for effecting improved convergence of the beams as they scan substantially the top and bottom regions of the raster image.

3,906,419

ADJUSTABLE DEFLECTION UNIT FOR TELEVISION PICTURE TUBES

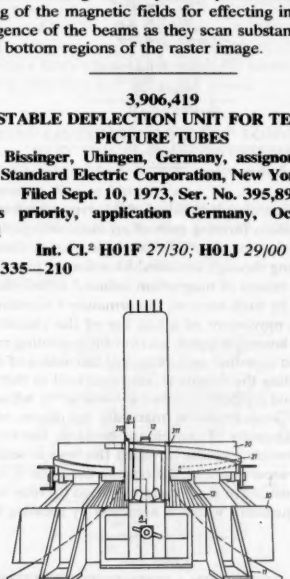
Norbert Bissinger, Uhingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,897

Claims priority, application Germany, Oct. 2, 1972, 2248311

Int. Cl.[2] H01F *27/30;* **H01J** *29/00*

U.S. Cl. 335—210 **6 Claims**



1. A deflection unit for a television picture tube comprising an outer support structure secured around the neck of the tube, an inner axially adjustable housing mounted on said support structure, a deflection coil secured to said inner housing and extending around said tube neck, a ring rotatably mounted on said outer support about the longitudinal axis of the deflection unit and along the neck of said tube, the outside of said ring having a screw thread whose pitch corresponds to the predetermined maximum axial travel of the deflection coil and inner housing, and a plurality of longitudinal guide elements secured about the circumference of the inner housing and extending outwardly along and about said ring in sliding engagement with the screw thread to cause axial movement of

said inner housing and deflection coil with rotation of said ring.

3,906,420

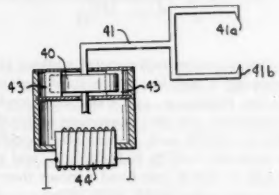
AVIONICS DISPLAY HAVING A ROTARY SOLENOID ACTUATOR THEREIN

Daniel L. Rodgers, and Thomas F. Cater, both of Olathe, Kans., assignors to King Radio Corporation, Olathe, Kans.

Division of Ser. No. 344,234, March 23, 1973. This application Apr. 25, 1974, Ser. No. 464,249

Int. Cl.[2] H01F 7/14

U.S. Cl. 335—272 2 Claims



1. A rotary solenoid for use in avionics equipment having an indicator therein which depicts aircraft deviation from preselected conditions, said solenoid comprising,

a rotary magnet,

deflection poles located to substantially surround said rotary magnet,

a single electromagnet, including means for connecting said electromagnet with a first signal corresponding to the deviation of the aircraft from a first condition,

means for locating said electromagnet in operative proximity to said rotary magnet and deflection poles in a manner to cause rotation of said rotary magnet corresponding to said first signal,

an elongate indicator pointer mechanically connected to said rotary magnet and movable therewith to depict the deviation of the aircraft from said first condition in response to said first signal, and

a pair of retract poles in operative proximity with said rotary magnet and spaced substantially 180° apart from one another, said retract poles operable to move said rotary magnet and indicator pointer out of view under certain preselected conditions such as the reception of a flag signal.

3,906,421

ROD CORE CHOKE FOR SUPPRESSOR APPLICATION IN PHASE-GATING CIRCUITS

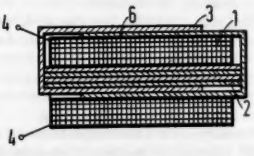
Josef Wimmer, Wenzenbach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 7, 1973, Ser. No. 413,637

Claims priority, application Germany, Nov. 16, 1972, 2256322

Int. Cl.[2] H01F 27/24

U.S. Cl. 336—178 4 Claims



1. In a choke employing a rod-type core, for suppressor applications in phase-gating circuits with controlled semiconductor components, the combination of a coil and a plurality of flat, elongated rectangular-shaped laminae disposed in alignment in side by side relation to form a rod-type core, at least one additional lamina, constructed of deep-drawing quality sheet metal, which additional lamina is of U-shaped configuration with relatively long legs and a relatively short base, one leg of which is inserted into the choke coil, taking the place of a corresponding first-mentioned rectangular-shaped lamina, to form a flux shunt, by means of which at least part of the magnetic flux otherwise closing through air, is forced in an almost air-gap-free magnetic loop.

3,906,422

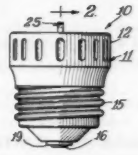
RESETTABLE FUSE

Robert M. Healy, Rt. 2, Box 359, Warrenville, Ill. 60555

Filed Sept. 16, 1974, Ser. No. 506,185

Int. Cl.[2] H01H 61/02

U.S. Cl. 337—141 15 Claims



1. A resettable fuse for controlling an electrical current, comprising:

means defining a first, fixed electrical contact;

means defining a second, movable contact;

means for releasably holding the second contact in electrical connected association with the first contact;

a heat-shrinkable retractor having a fixed end, a movable end connected to said movable contact, and a rectilinear mid-portion stretched between said ends;

heater means for carrying electrical current to be controlled in series with said first and second contacts to interrupt the current flow and de-energize said heater means for heat-shrinking said retractor as an incident of the current rising to a preselected value and thereby spacing said movable contact from said first fixed contact; and

manually operable means for selectively restretching said rectilinear mid-portion upon cooling thereof to permit said holding means to again hold said second contact in electrical connected association with the first contact.

3,906,423

HIGH-TEMPERATURE TEMPERATURE FUSE DEVICE

Kazuya Soda, Takahama, Japan, assignor to Nippondenso Co., Ltd., Japan

Filed Sept. 5, 1973, Ser. No. 394,476

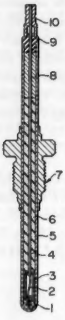
Claims priority, application Japan, Sept. 8, 1972, 47-90676; Sept. 14, 1972, 47-92597; Nov. 10, 1972, 47-113260

Int. Cl. H01h 85/04

U.S. Cl. 337—158 5 Claims

1. A high-temperature fuse device of the type in which a temperature fuse inserted between terminals is blown at a temperature higher than a predetermined value within the range of 700° to 1300°C. to break the electrical connection between said terminals when the fuse is subjected to an excessively high temperature from outside said fuse and wherein said temperature fuse comprises a noble metal, a connecting lead wire provided at each end of said temperature fuse, and a metal which does not form an alloy with said temperature

fuse and said connecting lead wire at a temperature of about 700° to 1300°C., disposed between said temperature fuse and



said connecting lead wire to connect said temperature fuse to said connecting lead wire.

3,906,424

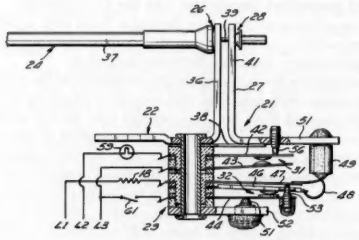
COOKING RANGE AND CONTROL THEREFOR

Raymond W. Clancy, and John W. Huffman, both of Mansfield, Ohio, assignors to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed May 13, 1974, Ser. No. 469,049

Int. Cl.[2] H05B *1/02;* **H01H** *37/48*

U.S. Cl. 337—394 **11 Claims**



1. A cooking range or the like comprising a smooth range top providing an upper surface for supporting and heating cooking utensils or the like, heating means spaced from and operable to supply heat to the lower surface of said range top, a warning signal device, and a thermostat providing a heat sensing assembly positioned between said range top and said heating means to sense the temperature of said range top and said heating means, said thermostat providing first and second switch means both operated by said sensing assembly, said first switch means being connected to operate said warning signal device whenever said range top is at a sufficient high temperature to cause a user to be burned if said range top is accidentally touched, said second switch means being connected to limit the operation of said heating means when the temperature of said range top reaches a temperature in excess of normal cooking temperatures and below a temperature at which said range top becomes damaged.

3,906,425

OXIDE SEMICONDUCTOR-METAL CONTACT RESISTANCE ELEMENTS

Kan-Ichi Tachibana; Michihiro Nishioka, and Mikiya Ono, all of Kitakyusku, Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,461

Claims priority, application Japan, June 22, 1972, 47-62588

Int. Cl. H01c *7/10*

U.S. Cl. 338—20 **1 Claim**

1. An oxide semiconductor-metal contact resistance element comprising a disk-like oxide semiconductor having a surface barrier resistance, said oxide semiconductor having negative resistance and also possessing a specific resistance value $R_0K\Omega$ at 273°K and a thermister constant $B°K$ that satisfy the relation $R_0 \times B \leqq 10{,}000K\Omega \cdot °K$, and two pieces of metal brought in direct and fixed contact therewith respectively, said metal being highly anticorrosive and having high electric conductivity.

3,906,426

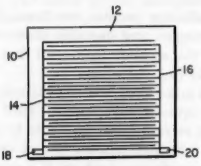
HUMIDITY SENSOR

Lawrence E. Frazee, South Huntington, N.Y., and Anthony V. Fraioli, Essex Fells, N.J., assignors to Plessey Incorporated, Melville, N.Y.

Division of Ser. No. 443,436, Feb. 19, 1974. This application Oct. 31, 1974, Ser. No. 519,604

Int. Cl.[2] H01C *13/00*

U.S. Cl. 338—35 **3 Claims**



1. A humidity sensor comprising:
a high-temperature resistant, dielectric substrate;
a double-fired layer of cobalt oxide on a major surface of said substrate, said double-fired layer having a lower than normal resistivity as a result of a second firing in a reducing atmosphere at about 1500°C. for a brief period; and
a fired-on pair of electrodes in contact with said double-fired layer.

3,906,427

CURRENT LIMITING DEVICE

Willem Brandhorst, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Aug. 2, 1974, Ser. No. 494,360

Claims priority, application Netherlands, Aug. 9, 1973, 7311026

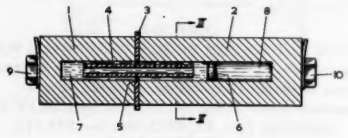
Int. Cl.[2] H01C *13/00*

U.S. Cl. 338—38 **4 Claims**

1. A current limiting device, comprising:
a two-part housing each including a terminal member;
an electrical conductor mounted between each of said terminal members and having an increasing resistance characteristic with increasing current flow whereby said conductor vaporizes;

an insulator for at least partially enclosing a portion of said conductor and surrounded by said conductor; and

an insulating member separating each part of said two-part housing, the periphery of said insulating member engaging the inner wall of the juncture of said two-part housing and said insulating member also engaging the outer sur-



face of said insulator for retaining said insulator, said conductor surrounding said insulator for exerting compressive stresses onto the surfaces of said insulator for opposing the tensile stresses generated within the insulator as a result of the pressure developed from said conductor at increased current flow.

3,906,428

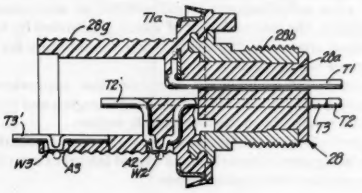
POTENTIOMETER TERMINATIONS

Sydney W. Frey, Jr., Upland, and Robert W. Gaines, Mira Loma, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Continuation of Ser. No. 340,998, March 14, 1973, abandoned, which is a division of Ser. No. 192,118, Oct. 26, 1971, Pat. No. 3,733,695. This application July 30, 1974, Ser. No. 493,193

Int. Cl.² H01C *1/144, 10/24*

U.S. Cl. 338—143 **5 Claims**



1. A potentiometer comprising:

first and second electrical conductors each comprising first and second end portions and an intermediate shaped termination portion of reduced cross-sectional area with one face of said intermediate termination portion adapted for connection to a resistance element;

a support member comprising means for supporting a resistance element and comprising a portion embedding and accurately fixing in respective positions said first and second electrical conductors with said one face of each of said shaped termination portions of the latter exposed at respective locations by said support member for direct contact with respective electrical ends of a resistance element; and

a helical resistance element on said support member with first and second electrical ends thereof fusion-united with respective ones of said electrical conductors at said locations;

each of the end portions of said first and second conductors being adapted to receive and transmit therebetween a current of sufficient magnitude to fusion-unite said resistance element ends with said electrical conductors by heating of said conductors at said locations.

3,906,429

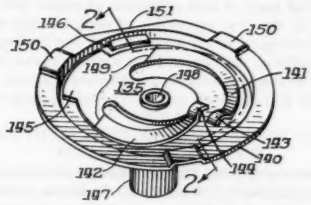
POTENTIOMETER WIPER ASSEMBLY

Robert H. Rhodes, Franklin Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 2, 1974, Ser. No. 494,113

Int. Cl.² H01C *1/12, 10/32*

U.S. Cl. 338—202 **7 Claims**



1. A potentiometer wiper assembly having a housing adapted for bonding to a substrate and including mounting means defining a plane;

resilient means movably mounted within said housing, said resilient means carrying a contact and normally urging said contact to a first position out of said housing below said plane;

stop means in the path of movement of said resilient means; said stop means and said resilient means coacting to maintain said contact in a second position, within said housing and above said plane to permit bonding of said mounting means to said substrate; and

means connected to said resilient means for releasing said contact to an operative position intermediate said first and second positions after bonding to said substrate.

3,906,430

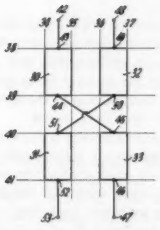
MATRIX RESISTORS FOR INTEGRATED CIRCUIT

Kyuichi Hareyama, and Shuzi Nakazawa, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Aug. 29, 1974, Ser. No. 501,791

Int. Cl.² H01C *1/01, 1/16*

U.S. Cl. 338—320 **6 Claims**



1. An integrated circuit device comprising a plurality of substantially rectangular resistance elements each having first and second electrodes, said resistance elements being substantially equal both in width and in length to each other, said resistance elements being arranged in an *n*-row by *n*-column matrix (where *n* stands for an integer larger than 1), said first and second electrodes of each of said resistance elements being respectively provided at the same positions in each of said resistance elements, the upper sides of all of said resistance elements belonging to the same row of said matrix being colinear with a straight line, the lower sides of all of said resistance elements of the same row being colinear with a straight line, the right sides of all of said resistance elements

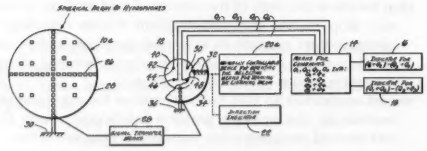
oelonging to the same column being colinear with a straight line, and the left sides of all of said resistance elements of the same column being colinear with a straight line, n numbers of first terminals respectively electrically connected with the first electrodes of the resistance elements of the first row, *n* numbers of second terminals respectively electrically connected with the second electrodes of the resistance elements of the *n*-th row, and means for respectively connecting the second electrodes of each of said resistance elements belonging to each row to the first electrodes of each of said resistance elements belonging to an adjacent row but belonging to a different column, thereby to form a series connection of *n* resistance elements belonging to different columns between each of said first terminals and each of said second terminals.

3,906,431

SEARCH AND TRACK SONAR SYSTEM

Walter L. Clearwaters, Waterford; Frederick J. Kingsbury, Guilford; Carlyle E. Shippey, Jr., Waterford, and John W. Soderberg, Niantic, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1965, Ser. No. 447,612
Int. Cl.[2] G01S *3/80*
U.S. Cl. 340—6 R **1 Claim**



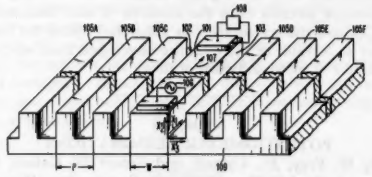
1. A tracking sonar system comprising:
a plurality of essentially identical hydrophones,
a rigid framework supporting the hydrophones in approximately equally spaced relationship, equidistant from a common locus point and identically oriented relative to the locus point,
a plurality of essentially identical brush contacts, one for each of said hydrophones,
signal transfer means coupling each hydrophone to a brush contact,
a second rigid framework supporting the brush contacts in an assembled relationship equidistant from and radially to a second common locus point and having geometric distribution about the second locus point corresponding to the geometric distribution of the corresponding hydrophones about the first locus point,
a beam forming member having a convex smooth spherical surface sector defining a solid angle which is a minor fraction of the solid angle defined by said brush contacts, for wiping engagement with said brush contacts,
said beam forming member including a series of coaxial conductor rings insulated from each other, each of said rings comprising four identical substantially 90° arcuate segments insulated from one another and together comprising part of the convex smooth spherical surface sector, said ring segments being arranged in four quadrants, means supporting said beam forming member for arcuately displacing the beam forming member about a first axis of the brush contact assembly that passes through the locus of the brush contacts and parallel to one of the two mutually perpendicular quadrant boundaries and for arcuately displacing the beam forming member about a second axis parallel to the other of the two mutually perpendicular quandrant boundaries and which intersects the first axis at the locus of the brush contacts and which is arcuately displaceable together with the beam forming member about the first axis,
means for combining signal energies from the conductor segments in each quadrant in a predetermined time relationship,
means for comparing the combined signal energies from the four quadrants, and
means responsive to the signal comparing means to locate the beam forming member for minimum differences among the outputs from the four quadrants.

3,906,432

GRATING GUIDES FOR ACOUSTIC SURFACE WAVES

Eric Albert Ash, London, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 273,576, July 20, 1972. This application June 27, 1973, Ser. No. 374,172
Int. Cl. H04b *11/00*
U.S. Cl. 340—15 **6 Claims**



1. A structure for guiding waves comprising:
a substrate material having at least one surface upon which elastic waves propagate;
an input means for coupling said acoustic waves onto said surface;
an output means for coupling said acoustic waves off of said surface;
a waveguide region extending longitudinally in the direction of wave propagation on said surface of said substrate material, the lateral extent of which is bounded by longitudinal edges which provide sharp discontinuity for said surface waves; and
a plurality of longitudinal discontinuities approximately parallel to said longitudinal waveguide region and periodically spaced from said waveguide region;
said periodicity of said plurality of longitudinal discontinuities being approximately equal to said lateral extent of said longitudinal waveguide region.

3,906,433

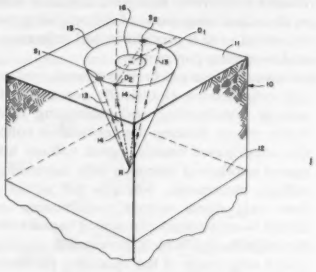
MULTI-DIRECTIONAL SEISMIC EXPLORATION METHODS

J. Lee Davis, Ector, Tex., assignor to Avance Oil & Gas Company, Inc., Midland, Tex.

Division of Ser. No. 145,811, May 21, 1971, Pat. No. 3,746,122. This application July 2, 1973, Ser. No. 375,640. The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.[2] G01V *1/28*
U.S. Cl. 340—15.5 MC **1 Claim**

1. In the art of evaluating geologic structures, a method for processing recorded seismic data to maximize geologically significant components and minimize meaningless noise components comprising:
identifying recordings of data signals generated by seismic reflections received from a single reflecting point but whose respective incident and reflected signal components lie in vertical planes which are on azimuths differing from one another, said reflecting point being on a vertical lone which is the intersection of said planes;
combining at least some of the so-identified recorded signals from different azimuths to produce a composite recorded signal wherein meaningless noise components

of the individual recordings are largely self-cancelled by the combining, said composite recorded signal thereby being representative of said reflecting point;



and displaying said composite recorded signal for evaluation in conjunction with other similarly processed composite recorded signals from other reflecting points.

3,906,434

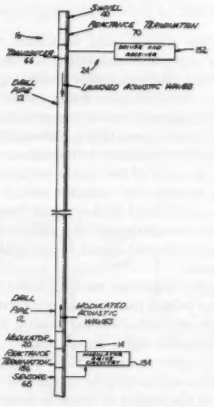
THREE-TERMINAL TELEMETERING SYSTEM FOR OIL WELLS

Arthur E. Lamel, Arcadia; William D. Squire, and Harper J. Whitehouse, both of San Diego, all of Calif., assignors to American Petroscience Corporation, Bakersfield, Calif.

Division of Ser. No. 113,147, Feb. 8, 1971, Pat. No. 3,790,930. This application Sept. 12, 1973, Ser. No. 396,403

Int. Cl. G01v *1/40*

U.S. Cl. 340—18 NC **20 Claims**



1. A method of communicating information between signal-transmitting and signal-receiving stations spaced along a pipe having an intervening length between said stations capable of sustaining acoustic waves within the substance of the pipe, said method comprising the steps of:

generating a modulating signal containing the information to be transmitted;

at a location separate from said transmitting station, generating acoustic waves subsequently to be modulated with the information to be transmitted, and causing said waves to travel along said pipe within the substance thereof to said transmitting station;

modulating said acoustic waves in said pipe at said transmitting station by said modulating signal according to a predetermined modulating mode to contain the information to be transmitted, all in such manner that resulting modulated acoustic waves then travel from said transmitting station to said receiving station through the substance of the pipe; and

receiving said modulated waves at said receiving station to recover said signal and its contained information.

3,906,435

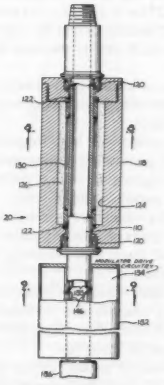
OIL WELL TELEMETERING SYSTEM WITH TORSIONAL TRANSDUCER

Arthur E. Lamel, Arcadia; William D. Squire, and Harper J. Whitehouse, both of San Diego, all of Calif., assignors to American Petroscience Corporation, Bakersfield, Calif.

Division of Ser. No. 113,147, Feb. 8, 1971, Pat. No. 3,790,930. This application Sept. 12, 1973, Ser. No. 396,400

Int. Cl. G01v *1/40*

U.S. Cl. 340—18 NC **34 Claims**



1. In an acoustic communication system for use in well drilling equipment, the combination of:

a drill string inclusive of a drill pipe, said drill string being adapted to the propagation along its length of zero order torsional acoustic waves within its substance, and

an electroacoustic transducer for transducing between an electrical signal and zero order torsional acoustic waves propagating along the length of said drill string within the substance of said drill pipe, said transducer embodying a member connected into and functioning mechanically and acoustically as part of said drill string,

said transducer member including a field-strain element adapted to experience a torsional mechanical strain in the presence of a magnetic field, and, conversely, a magnetic field in the present of a torsional mechanical strain, and signal field means magnetically coupled to said field-strain element, all in such manner and arrangement as to transduce between a magnetic signal field and zero order torsional acoustic waves within the substance of said field-strain element and said drill pipe.

3,906,436
DETECTION SYSTEM FOR THE LOCATION OF MOVING OBJECTS

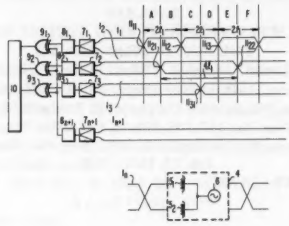
Noritaka Kurauchi; Kenichi Yoshida; Yoshinobu Kobayashi, and Masataka Kuroda, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 6, 1974, Ser. No. 440,217

Claims priority, application Japan, Feb. 8, 1973, 48-15824; Feb. 8, 1973, 48-15825

Int. Cl.[2] G08G *1/12*

U.S. Cl. 340—23 **2 Claims**



1. A system for detecting the absolute address location of a moving object by the use of inductive radio comprising;

1. *n* pairs of crossing pairs of lines each having crossing period of $l_1 \times 2^n$ ($n = 1, 2, 3, \ldots$) and by which all of the addresses of 2^n locations can be represented in a manner different with each other, the unit length of the address being l_1;
2. a parallel pair of lines which is not crossed;
3. means for generating high frequency signals mounted on the moving object;
4. an antenna supplied with high frequency signals from said high frequency generating means and electromagnetically coupling said signals to said *n* pairs of crossing pair of lines and one parallel pair of lines;
5. $(n + 1)$ circuits which are connected respectively to the ends of said *n* pairs of crossing pairs of lines and said one parallel pair of lines, and receivng and amplifying high frequency signals;
6. *n* phase detectors which are connected to said receiving and amplifying circuits and comparing the phase of the signal received on each crossing pair of lines and that on the parallel pair of lines; and
7. registers connected to said phase detectors and storing binary signals "1" and "0" corresponding respectively to the state in same phase or in the opposite phase; thereby comparing the phase of the signals, induced from said moving object and received by said *n* pairs of crossing pairs of lines with that received on said one parallel pair of lines to detect the binary coded absolute address.

3,906,437
DEVICE FOR MONITORING THE OPERATING PARAMETERS OF A DYNAMIC SYSTEM

Rowland Brandwein, and Mohan Gupta, both of Shawnee Mission, Kans., assignors to Textron, Inc., Providence, R.I.

Filed Sept. 7, 1973, Ser. No. 395,185

Int. Cl. G01m *15/00*; G08g *5/00*

U.S. Cl. 340—27 **13 Claims**

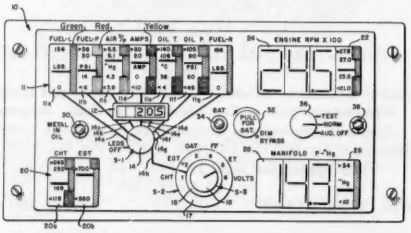
1. Device for monitoring the operating parameters of a dynamic system the magnitude of which operating parameters may vary between predetermined minimum and maximum measured values which comprises:

a plurality of sensors each one of which is adapted to measure the magnitude of a specific operating parameter and to generate a sensor signal voltage that varies directly with the magnitude of the operating parameter being measured,

sensor signal voltage conditioning and calibrating means electrically connected to each sensor, said means transforming the sensor signal voltage to a conditioned analog signal voltage the magnitude of which is in the same relative proportion to a predetermined reference voltage as the actual magnitude of the operating parameter being measured is to a predetermined reference magnitude of said operating parameter,

continuous voltage gradient to incremental voltage gradient converter means electrically connected to each signal voltage conditioning and calibrating means, said converter means dividing the continuous voltage gradient of the conditioned analog signal voltage into a predetermined number of incrementally increasing analog signal voltage increments, whereby the actual signal voltage from said signal voltage conditioning and calibrating means is converted to an analog signal voltage increment the magnitude of which corresponds approximately to the actual magnitude of the operating parameter being measured,

analog signal voltage increment indicator means electrically connected to the cntinuous to incremental voltage gradient converter means, said indicator means having an electrically energized visual display means corresponding to each of said predetermined analog signal voltage increments, said visual display means visually indicating the analog signal increment that corresponds to the actual magnitude of the operating parameter being measured,



manually operated selector switch means also electrically connected to each of the signal voltage conditioning and calibrating means, said selector switch being adapted to select the conditioned analog signal from a particular one of the signal conditioning and calibrating means and to transmit said selected signal to an analog to digital converter means,

analog to digital converter means electrically connected to said selector switch means, said converter means converting the selected conditioned analog signal to a corresponding multibit digita signal, and

a first array of alpha-numeric visual display units electrically connected to said analog to digital converter means, said display units displaying in numeric form the actual magnitude of the particular operating parameter that corresponds to the particular conditioned analog signal selected by said selector switch means.

3,906,438
SYSTEM FOR MONITORING TRAFFIC CONDITIONS IN CONNECTION WITH THE CONTROL THEREOF

Dietrich Kohnert, Eichenau, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 14, 1973, Ser. No. 332,258

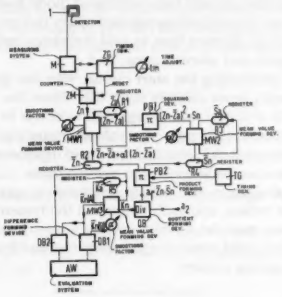
Claims priority, application Germany, Feb. 17, 1972, 2207487

Int. Cl.[2] G08G *1/01*

U.S. Cl. 340—38 R **23 Claims**

1. A system for monitoring traffic flow on streets having at least two traffic lanes free from oppositely directed traffic,

particularly highways, wherein each traffic lane can be monitored, at least at one common monitoring location, by respective vehicle detectors, comprising for each detector a measuring system for deriving representative magnitudes of time intervals between successive vehicles at the associated detector, means for forming values representative of such magnitudes and comprising a mean value device to which interval magnitudes are supplied, and a memory for storing successive mean interval values derived from said mean value device, the



output of said value forming means supplying such representative values, comparison means for effecting a predetermined comparison function between a plurality of representative values, and means operatively connecting corresponding outputs of the respective value-forming means of a plurality of said detectors to said comparison means for comparison of the respective representative values of said detectors, the output of said comparison means being operative to provide an evaluatable output magnitude related to the traffic flow.

3,906,439

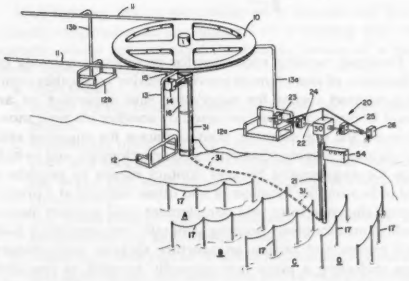
TRAFFIC CONTROL SYSTEM FOR CONVERGING LANES, SUCH AS WHEN BOARDING A SKI LIFT

Doyle L. Hopla, 801 Sperry Ave., Patterson, Calif. 95363

Filed Mar. 18, 1974, Ser. No. 451,981

Int. Cl.[2] G08G *1/00*

U.S. Cl. 340—44 **6 Claims**



1. A traffic control system for controlling boarding of a ski lift, including in combination:

a ski lift having a series of moving spaced apart skier lift means and a loading station by which each said skier lift means passes,

marker means for queuing skiers awaiting a lift into a plurality of separate lanes terminating at a location adjacent said loading station,

means for displaying a GO signal for each said lane positioned viewably adjacent the termination thereof,

signal control means for displaying the GO signal for one late at a time only and for advancing the GO signal from lane to lane in a controlled endlessly repetitive cycle, and

display advance actuation means connected to said signal control means and actuated by the arrival of a skier lift means at a predetermined location for causing said signal control means to advance said GO signal.

3,906,440

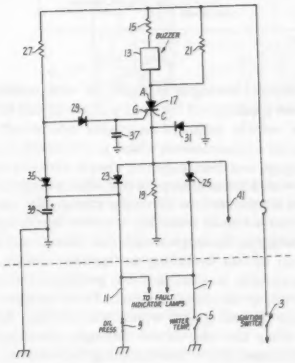
ENGINE WARNING DEVICE

Albert J. Haupt, 222 Junipero Ct., Capitola, Calif. 95010

Filed Nov. 21, 1973, Ser. No. 417,737

Int. Cl.[2] B60Q *5/00*

U.S. Cl. 340—52 F **2 Claims**



1. In an audible warning system for an engine having a first switch, said switch being off when the engine is off and being on when the engine is running, and having a second switch connected to a warning light, said second switch being normally closed and remaining closed when said engine is first started, and opening, extinguishing said light, when the engine reaches operating speed, said second switch reclosing and turning said light on when a dangerous condition in the engine exists, the improvement comprising:

a. an audible device, said audible device being connected to said first switch in series with an SCR having the usual gate and having a first resistor, said first resistor being in parallel with said second switch,

b. said first resistor being of sufficiently high value to prevent said audible device from sounding when it is in series therewith,

c. a second resistor in parallel with said audible device, said second resistor being adapted to provide gate current to fire said SCR and having a path to ground through said second switch,

d. said second switch normally providing a ground path for the gate of the SCR when said switch is closed whereby said SCR will not fire,

e. said second resistor providing gate current to fire said SCR when said second switch is opened,

f. said audible device not being turned on when said SCR fires because of the limiting action of the high resistance of said first resistor, and

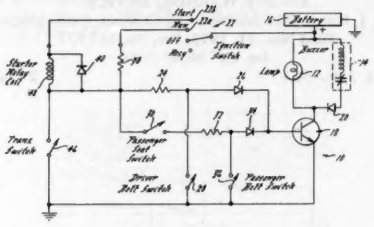
g. said second switch shorting said first resistor when said second switch closes, causing said audible device to sound.

3,906,441

VEHICLE SAFETY BELT WARNING CIRCUIT

Poul H. Andersen, Royal Oak, and Robert E. Klacza, Taylor, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sept. 16, 1974, Ser. No. 506,150
Int. Cl.[2] B60R 21/10
U.S. Cl. 340—52 E 4 Claims



1. In a vehicle having a plurality of seat positions each equipped with a safety belt for use by an occupant thereof and wherein the vehicle includes an engine operatively coupled with wheels via a transmission which is selectively operable to drivingly engage and disengage the wheels with the engine and is provided with a transmission switch which is open when the transmission is operated to drivingly engage the engine with the wheels and is closed when the transmission is operated to drivingly disengage the engine with the wheels and an engine start and run circuit including an ignition switch which is selectively operable to start and run positions for selectively coupling a battery via a start contact of said ignition switch to a start circuit including said transmission switch for starting the engine when the wheels are drivingly disengaged therefrom by the transmission and coupling the battery via a run contact of said ignition switch to a run circuit for running the engine, a safety belt warning system for providing a warning signal indicative of non-use of a safety belt by an occupant of any of said plurality of seat positions, said system comprising:

an alarm means energizable from the battery to provide said warning signal;

a transistor having its emitter-collector circuit coupling said alarm means in circuit with the battery so that when base current flows in the transistor the emitter-collector circuit thereof conducts current from the battery to energize said alarm means;

a plurality of input circuits each operatively coupling a corresponding one of said seat positions to the base of said transistor for controlling base current flow in said transistor;

one of said input circuits comprising a seat switch which is open when the corresponding seat position is unoccupied and closed when the corresponding seat position is occupied, a safety belt switch which is open when the corresponding safety belt is not in use and closed when the corresponding safety belt is indicated to be in use, a diode, means connecting said diode and said seat switch in series from said ignition switch run contact to the base of said transistor such that with the ignition switch in the run position, current is conducted from the battery through said seat switch and said diode to said transistor to create base current flow therein for causing said alarm means to be energized, and means connecting said safety belt switch in said one input circuit such that when said safety belt switch is closed current flowing into said transistor through said seat switch and said diode is shunted through said safety belt switch from said diode and said transistor to terminate base current flow in said transistor and thereby de-energize said alarm means;

another of said input circuits comprising a safety belt switch which is open when the corresponding safety belt is not in use and closed when the corresponding safety belt is indicated to be in use, a diode, means connecting said last-mentioned diode in series from said ignition switch run contact to the base of said transistor such that with the ignition switch in the run position current is conducted from the battery through said last-mentioned diode to said transistor to create base current flow therein for causing said alarm means to be energized, and means connecting said last-mentioned safety belt switch in said another input circuit such that when said last-mentioned safety belt switch is closed current flowing into said transistor through said last-mentioned diode is shunted therefrom by by said last-mentioned safety belt switch to terminate base current flow in said transistor and thereby de-energize said alarm means; and

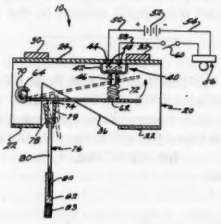
means connecting the start circuit with the ignition switch and said input circuits such that when the transmission switch is closed and the ignition switch is in the run position current flowing through said run contact of said ignition switch is shunted from said input circuits through the transmission switch to prevent base current flow in said transistor and, hence, prevent energization of said alarm means, and such that when the transmission switch is open and the ignition switch is operated to the start position, said input circuits are prevented from energizing the starting circuit.

3,906,442

TRACTOR-TRAILER SENSING APPARATUS FOR INDICATING THE PROXIMITY OF THE TRAILER TO THE TRACTOR

Vern D. Mosteller, 2412 W. State Rd., Hastings, Mich. 49058

Filed June 27, 1973, Ser. No. 374,094
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—61 21 Claims



1. Proximity sensing apparatus for providing a warning of the closeness of one element moving relative to another comprising support means for supporting said apparatus on an element in position to be contacted by another element moving toward the one element; contact means for engaging said other element moving relative to said one element; and switch means for engagement by said contact means to provide a signal indicating the location of said other element at a predetermined distance from said one element; said support means including an elongated housing generally encompassing said switch means and having an aperture therein; said contact means including a pivot arm pivotally secured at one end within said housing, extending to a position adjacent said switch means, and being pivotable to engage and close said switch means, and elongated, extending rod means secured to said pivot arm and extending through said aperture a predetermined distance beyond said housing for engaging said other element as it approaches said one element and causing pivotal movement of said pivot arm into engagement with said switch means; said extending means including deflectable means for absorbing a further change in distance between said elements after said arm is pivoted into contact with said switch means, said deflectable means including an elongated rod including at least one flexible, yieldable section having sufficient rigidity to pivot said pivot arm into engagement with said switch means

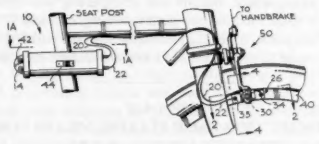
when contacted by said one element as it approaches the other as well as sufficient resiliency to bend or flex to prevent damage to said sensing apparatus including said rod and switch means as well as said elements when said other element continues to approach said one element after said pivot arm contacts and closes said switch means, said resiliency being sufficient to return said rod and flexible, yieldable section to its original configuration after said other element is moved away from said one element; said rod including a spring element along its length, said spring element providing both said sufficient rigidity to operate said pivot arm and switch means and sufficient resiliency to prevent said damage to said sensing apparatus including said rod and switch means as well as said elements.

3,906,443

BICYCLE BRAKE INDICATING OR STOP LIGHT CIRCUITRY WITH SWITCH CONTACTS MOUNTED ON BRAKING ELEMENT

Don L. Musselman, 20600 Londelius St., Canoga Park, Calif. 91306

Filed Feb. 21, 1974, Ser. No. 444,474
Int. Cl.[2] B60Q *1/44*; **B62L** *1/00*; **H01H** *3/16*
U.S. Cl. 340—69 **7 Claims**



1. A lighting device mountable on a bicycle and the like, visually responsive to engagement of a braking pad with a metallic wheel rim arranged thereon, by means of a manual lever operation, comprising:

a. light means;

b. power supply means electrically connected with the light means;

c. attachment means having a cut-out portion for mounting over and longitudinally overlapping the end surfaces of the brake pad, each of said overlapping portions having an aperture;

d. two tubes each of which is mounted, respectively, in the apertures of the attachment means;

e. a first wire, one end of which is electrically connected to said light means, the other free end of which is caused to pass through the upper inlet of one of the tubes;

f. a second wire, one end of which is electrically connected to said power supply means, the other free end of which is caused to pass through the upper inlet of the other tube;

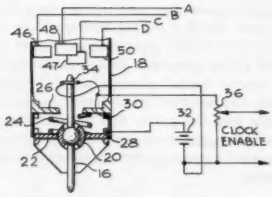
g. two electric contact means attached, respectively to the free ends of the first and second wires, and projecting outside the lower outlets of the two tubes, so as to lie substantially flush with the lower end surfaces of the brake pad and co-acting simultaneous therewith to engage the metallic wheel rim by means of the manual lever operation, whereby an electric circuit is closed between the contact means and the wheel rim, causing electric current to flow through the wires, the power supply means and light means, causing the light means to light up.

3,906,444

SPECIAL PEN AND SYSTEM FOR HANDWRITING RECOGNITION

Hewitt David Crane, Portola Valley, and Robert Ellis Savoie, Mountain View, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Oct. 11, 1973, Ser. No. 405,296
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 SY **14 Claims**



1. A system for verifying a signature, written with a writing instrument, with a previously written signature comprising

means, responsive to the direction of motion of said writing instrument while writing said signature to generate direction signals representative thereof,

means for generating clock signals,

means responsive to said direction signals and said clock signals to produce first clocked direction signals only during the intervals of clock signals,

means for establishing second clocked direction signals for said previously written signature,

means for normalizing said first clocked direction signals with respect to said second clocked direction signals,

means for comparing said normalized first clocked direction signals with said second clocked direction signals of said previously written signature and producing a verification or non-verification output signal, and

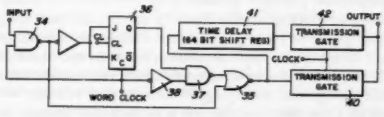
means responsive to said output signal to indicate verification or non-verification.

3,906,445

ALPHANUMERIC TERMINAL FOR A COMMUNICATIONS SYSTEM

Robert M. Beckmann, Hanover Park; James A. Lamb, Hoffman Estates; Donald J. Nieglos, Arlington Heights, and Gary R. Reynolds, Streamwood, all of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 21, 1974, Ser. No. 516,325
Int. Cl.[2] H04L *1/10*, *1/08*, *1/06*
U.S. Cl. 340—146.1 BA **16 Claims**



1. In a communications system utilizing digitally encoded messages and including a transmitter and receiver, a terminal with the capability of sending predetermined messages comprising:

a. keyboard means providing text signals representative of alphanumeric characters and control signals in response to operation of keys thereon;

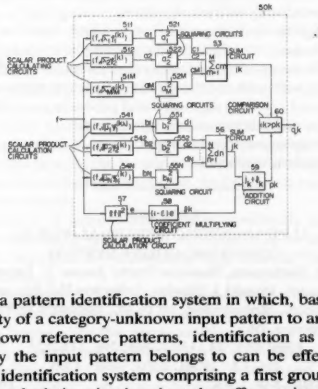
b. a text memory connected to receive and store the text signals from said keyboard means;
c. a fixed message memory having therein predetermined messages and connected to receive control signals from said keyboard means for selecting predetermined messages therein in response to operation of control keys on said keyboard means;
d. an address memory having therein an address code of said transmitter and receiver;
e. logic circuitry connected to receive the text signals from said text memory, the selected predetermined messages from said fixed message memory and the address code from said address memory and providing a first digital message serially including the text signals, the selected predetermined messages and the address code;
f. a parity generator and interleaving circuit connected to receive the first digital message from said logic circuitry and periodically generate and insert parity bits therein, said parity generator and interleaving circuit developing a second digital message serially including the text signals, the selected predetermined messages, the address code and the parity bits and interleaving the first and second digital messages into a composite message; and
g. means connecting the composite message to said transmitter.

3,906,446

PATTERN IDENTIFICATION SYSTEM

Taizo Iijima, Tokyo, and Kenichi Mori, Yokohama, both of Japan, assignors to Taizo Iijima, Tokyo, Japan and Tokyo Shibaura Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 7, 1974, Ser. No. 496,012
Claims priority, application Japan, Aug. 8, 1973, 48-88537
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 MA **15 Claims**



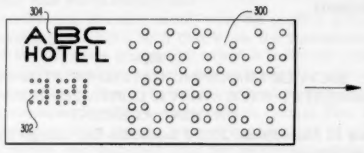
1. In a pattern identification system in which, based on the similarity of a category-unknown input pattern to any of category-known reference patterns, identification as to which category the input pattern belongs to can be effected, said pattern identification system comprising a first group of inner product calculating circuits adapted to effect an inner product calculation between the input pattern and each of M number of reference patterns preliminarily provided for each of K number of categories and showing an orthonomal relation; a second group of inner product calculating circuits adapted to effect an inner product calculation between the input pattern and each of N number of reference patterns provided for each of the categories, satisfying an orthonomal relation with respect to each other and having a orthogonal relation to each of the M number of reference patterns; a first group of squaring circuits for obtaining the squared value of an output from each of the inner product calculating circuits of said first group; a second group of squaring circuits for obtaining the squared value of an output from each of the inner product calculating circuits of said second group; first sum means for adding together outputs from the squaring circuits of said first group; second sum means for adding together outputs from the squaring circuits of said second group; and means for obtaining, from the first and second sum means provided for each category, a signal representating the similarity of the input pattern to the reference pattern.

3,906,447

SECURITY SYSTEM FOR LOCK AND KEY PROTECTED SECURED AREAS

Paul A. Crafton, 11822 Charen Ln., Potomac, Md. 20854

Filed Jan. 31, 1973, Ser. No. 328,179
Int. Cl. H04q *3/00*
U.S. Cl. 340—149 A **21 Claims**



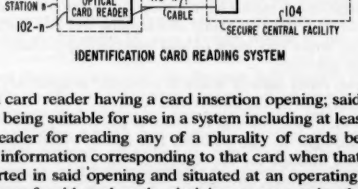
1. A lock mechanism for generating an unlock trigger signal, said mechanism including storage means storing a key code and comparison means for comparing the stored key code with an applied key code to cause the generation of the unlock trigger signal when the two key codes coincide, the improvement comprising:
a machine readable card having formed thereon an order code and a key code enciphered together,
means in said lock mechanism for reading said order code and key code in enciphered form,
means for deciphering said order code and said key code, first comparison means for comparing the order code with a lock mechanism generated signal, and
means responsive to said comparison for storing the key code read from said coded key in said storage means.

3,906,448

FAULT DETECTION FACILITATING MEANS FOR CARD READER OF IDENTIFICATION CARD READING SYSTEM

Frank Fini Henriques, Holte, Denmark, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,896
Int. Cl.[2] G06K *19/08*
U.S. Cl. 340—149 A **6 Claims**



IDENTIFICATION CARD READING SYSTEM

1. A card reader having a card insertion opening; said card reader being suitable for use in a system including at least one card reader for reading any of a plurality of cards bearing coded information corresponding to that card when that card is inserted in said opening and situated at an operating position thereof; said card reader deriving an output signal manifesting the coded information borne by a card situated at said operating position, said system further including processing means coupled to said reader and having said output signal therefrom applied thereto for processing the information manifested by said output signal; the improvement in said card reader comprising:
means including a test card element bearing predetermined standard coded information, said element being movably secured to said reader and being situated with respect to said opening to be moved from a given home position

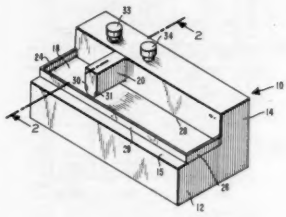
thereof to another position thereof by the insertion of any of said plurality of cards into said opening and to be returned to said given home position thereof by the withdrawal of that inserted card, and wherein said test-card element when in its home position is situated at the operating positions of said opening.

3,906,449

PAPER MONEY IDENTIFIER

Frank J. Marchak, 5802 Shoal Creek Blvd., Austin, Tex. 78757

Filed Sept. 11, 1974, Ser. No. 504,931
Int. Cl. H04q *5/00*
U.S. Cl. 340—149 R **16 Claims**



1. A currency identification apparatus for aiding blind persons in identifying currency, comprising:

means generating a light beam;

photoresponsive means for receiving said light beam, the resistance of said photoresponsive means varying in accordance with the amount of light received;

means for directing said light beam along a path between said generating means and said photoresponsive means which path includes the currency to be identified,

capacitor means connected in electrical series with said photoresponsive means, said capacitor means being charged through said photoresponsive means, so that the time required to charge said capacitor is directly proportional to the resistance value of said photoresponsive means;

transistor means connected to said capacitor means, said transistor being biased into conduction whenever the charge on said capacitor reaches a predetermined level; and

loudspeaker means connected to said transistor means, said capacitor means discharging through said speaker means to produce an audible tone whenever said transistor conducts.

3,906,450

ELECTRONIC SYSTEM FOR THE RECORDING OF PERIODICALLY SAMPLED VARIABLES

Eduardo da Silva Prado, Jr., Rua Sao Remigio, No. 30, Sao Paulo, Brazil

Continuation of Ser. No. 410,110, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 187,905, Oct. 8, 1971, abandoned. This application Oct. 24, 1974, Ser. No. 517,796
Claims priority, application Brazil, Oct. 9, 1970, 222937
Int. Cl.[2] H04B *1/00;* **H04N** *1/44;* **H04M** *11/00*
U.S. Cl. 340—150 **1 Claim**

1. An electronic system for the analysis of television audience ratings by monitoring and processing into a recorder the code pulse signals received from the channel selector switch of a television set, said processing into the recorder being in the form of units of words of an even number of pulses each, said system comprising:

a television receiver set having a channel selector switch,

a generator of code pulses connected to the channel selector switch for supplying code pulses indicative of the station received,

a receiver connected by transmission means to said generator of the code pulses from the station received,

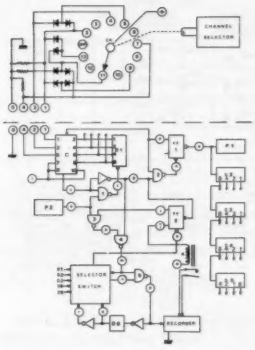
a memory for storing the code pulses of the station received,

a comparator connected to said receiver for receiving the code pulses and for distinguishing them from the code pulses previously stored in the memory,

a logic circuit connected to the memory and to the comparator,

a selector switch connected to the logic circuitry,

a recorder connected to the logic circuit and to the selector switch,



a source of timing and control means providing timing and control pulses to the memory, comparator logic circuit, selector switch and recorder,

a parity pulse generating circuit connected to the output of pulses from the selector switch and consisting of an inverter of said pulses and of a divider of the inverted pulses to provide an additional pulse which is added to output of the selector switch to insure that each word recorded always contains an even number of pulses,

said recorder being activated by pulses from the comparator when the newly received code pulses at the comparator differ from the code pulses previously stored in the memory.

3,906,451

PLASMA PANEL ERASE APPARATUS

Richard Albert Strom, Richfield, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 15, 1974, Ser. No. 461,044
Int. Cl.[2] H04B *3/32;* **H04N** *3/10*
U.S. Cl. 340—166 EL **13 Claims**

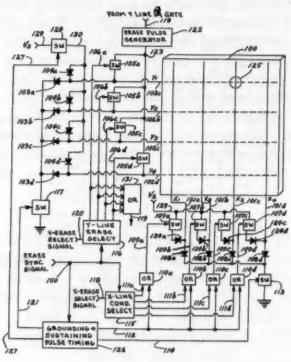
10. In a gas discharge display matrix of the type having a chamber containing ionizable gas and formed of a dielectric having a plurality of spaced-apart first electrodes on a first side of the chamber and a plurality of spaced-apart second electrodes on a second side of the chamber nonparallel to the first electrodes, said electrodes located so as to interpose an ionizable gas volume and a portion of the dielectric between each first electrode and each second electrode; and having a pulse generator for sustaining light emission from all gas volumes having a wall charge voltage exceeding a predetermined value by applying sustaining pulses of predetermined voltage to at least one of the pluralities of first and second electrodes causing voltage potential on the first electrodes to alternately rise above and fall below the potential on the second electrodes; wherein the invention comprises improved apparatus for extinguishing light emission from the selected gas volume

between a selected first and a selected second electrode specified by first and second erase select signals, respectively, comprising:

a. means for interrupting for a preselected time application of sustaining pulses after substantial completion of a selected sustaining pulse, responsive to an erase select signal;

b. switch means for connecting to a reference voltage, responsive to a switch closure signal, each second electrode specified thereby;

c. means responsive to the second erase select signal for applying a switch closure signal to the switch means specifying the selected second electrode;



d. means responsive to the second erase select signal for applying simultaneously to all the first and second electrodes excepting the selected second electrode a conditioning pulse which overlaps the period of connection of the selected second electrode to the reference voltage and which is sufficient to cause reversal in polarity of the residual electric charge in the dielectric adjacent the selected second electrode; and

e. means responsive to the first erase select signal for applying to the selected first electrode an erase pulse following the conditioning pulse and overlapping the period of connection of the selected second electrode to the reference voltage, and which is sufficient to reduce below that necessary to permit sustaining of light emission, the residual electric charge in the dielectric adjacent the gas volume between the two selected electrodes.

3,906,452

METHOD FOR CONNECTING AND DISCONNECTING SYSTEM UNITS IN A MODULARLY CONSTRUCTED DATA PROCESSING SYSTEM

Hans-Ulrich Möder, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 3, 1972, Ser. No. 240,465

Claims priority, application Germany, Apr. 7, 1971, 2117128

Int. Cl.[2] G06F *13/00*

U.S. Cl. 340—172.5 **5 Claims**

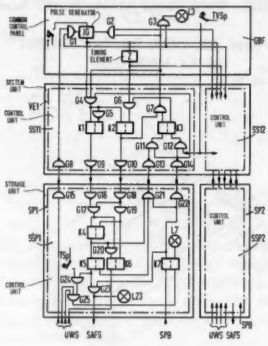
1. In a program controlled data processing system of modular construction, which system contains processing units and central storage units, said processing units and said central storage units communicating in a cylical manner, a method for switching on and switching off connections between processing units and central storage units, comprising the steps of:

initiating a switching on condition for establishing a connection between at least a said processing unit and a said central storage unit,

generating and transmitting from a said central storage unit a static signal only if that central storage unit is in a ready for service condition,

evaluating said transmitted static signal in said processing units which are in a switched on condition,

generating and transmitting from said processing units in a switched on condition, responsive to said evaluating step, a static and dynamic signal to said central storage units,



evaluating said static and dynamic signals in said central storage units and transmitting, responsive thereto, a dynamic signal to said processing units enabling the switching on of connections and

evaluating the static signals initiating the switching off condition by determining the absence of said static signals in said processing units and said central storage units and, responsive thereto, causing the disconnection of existing connections.

3,906,453

CARE MEMORY CONTROL CIRCUIT

Bruno A. Mattedi, Villa Park, and Jitendra G. Nemivant, Skokie, both of Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

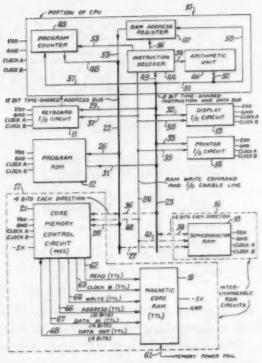
Filed Mar. 27, 1974, Ser. No. 455,417

Int. Cl.[2] G06F *13/06*

U.S. Cl. 340—172.5 **7 Claims**

1. In combination with an electronic digital processing system having an addressable program read-only memory, an addressable volatile semiconductor random access memory, central processing means for obtaining and executing program instruction signals from said read-only memory and for retrieving variable transaction output data signals from and simultaneously entering variable transaction input data signals into said semiconductor random access memory, time-shared address bus means for receiving address signals from said processing means to sequentially and repetitively access preselected address locations in said read-only memory and said random access memory during first and second interstiched time intervals, respectively, time-shared instruction and data bus means connected to said processing means and operable to obtain said instruction signals during said second time intervals, and to retrieve said output data signals and enter said input data signals during said first time intervals, both said address bus means and said instruction and data bus means being cleared of signals during the time intervals between said first and second time intervals, and write command means connecting said processing means with said random access memory for providing write command signals to the latter to enter said input data signals therein during certain of said first time intervals in accordance with said instruction signals; wherein the improvement comprises core memory control

circuit means for compatibly connecting said address bus means, said instruction and data bus means and said write command means with a non-volatile magnetic core random access memory having repetitive memory cycles each initiated after a said second time interval and comprising first and second parts, output data signals being retrieved from said core memory during said first parts and input data signals being entered into said core memory during said second parts, said core memory control circuit means comprising: memory cycle timing signal means for repetitively initiating each said memory cycle and sequentially determining said first and second parts thereof, core memory write signal means for controlling said core memory to enter said input data signals therein during certain of said second parts in response to said write command signals, address latching means for stabilizing



prior to each said first part said random access memory address signals received from said address bus means during the said second time interval next preceding said first part, data latching means for stabilizing prior to each said second part said input data signals received from said instruction and data bus means during the said first time interval next preceding said second part, and data output means for presenting at the output thereof said output data signals retrieved from said core memory said instruction and data bus means during each said first time interval and for floating said output during each said second time interval, whereby said core memory control circuit means renders said sequentially read and written magnetic core random access memory interchangeable with said simultaneously read and written semiconductor random access memory.

3,906,454
COMPUTER MONITORING SYSTEM

Robert Lanham Martin, Greensboro, N.C., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

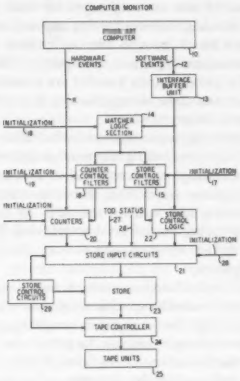
Filed May 18, 1973, Ser. No. 361,559
Int. Cl.[2] G06F *11/00, 11/06*
U.S. Cl. 340—172.5 **7 Claims**

1. A computer monitor system comprising

a software event selection circuit responsive to programmed event signals and preselected constant signals for selecting one of a plurality of received software event signals, a hardware event counting circuit responsive to hardware event signals for counting selected ones of said hardware event signals, and

a counter control circuit responsive to said software event selection circuit for enabling, disabling, incrementing, or storing the output of said hardware event counting circuit,

said software event selection circuit including

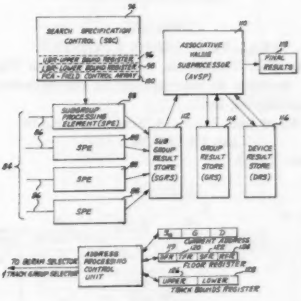


a plurality of matching circuits for matching source identification signals, event identification signals and event value signals with respective preselected constant signals for each said programmed event signal.

3,906,455
ASSOCIATIVE MEMORY DEVICE

George B. Houston, Seattle, and Roger H. Simonsen, Federal Way, both of Wash., assignors to Boeing Computer Services, Inc., Seattle, Wash.

Filed Mar. 15, 1974, Ser. No. 451,634
Int. Cl.[2] G11C *15/00*
U.S. Cl. 340—172.5 **13 Claims**



1. An associative memory device comprising:

a. a data storage device wherein;

1. data is stored and retrieved in predefined data blocks of equal numbers of bits;
2. the data in said data blocks is maintained in a constantly circulating state;
3. means are provided for reading said data blocks from said storage device and for writing said data blocks to said storage device;
4. said data in said data blocks is read from said storage device and written to said storage as the circulating data passes said means for reading and writing said data blocks;
5. said data blocks are comprised of data subblocks of equal numbers of bits;

6. said data sub-blocks are divided into data fields as defined by each individual request to the associative memory device.

b. a data storage device acquisition logic segment wherein;

1. said data blocks are addressed by data block groups, each data block group containing at least one data block;

2. said data block groups are comprised of data block subgroups containing equal numbers of data blocks;

3. means for parallel data transfer are provided to transfer data from said data storage device in parallel in units of data block subgroups, and

c. a data processing logic segment wherein;

1. a subgroup processing element is provided for each data block subgroup contained in a data block group, each subgroup processing element containing means for receiving and storing the data in one data block subgroup being transferred in parallel from said data storage device by said data storage device acquisition logic segment;

2. a search specification control logic segment is provided, said search specification control logic being accessible by the computer program accessing said associative memory device to preset the limits of data search, the definition of said data fields, and the search success criteria for the duration of each access where access is the time from a request for an associative search by a computer program to said associative memory device until said associative memory device returns the results of the search to the requesting computer program;

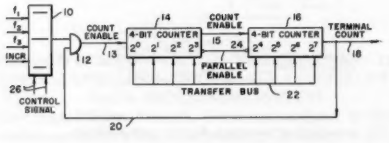
3. logic is provided to combine the data in said subgroup processing elements and said search specification control logic to arrive at a best value from each data block subgroup and then combine said best values from the data block subgroups to arrive at a best value for the data block group;

4. logic is provided to cause said data storage device acquisition logic to transfer additional data block groups within the limits specified by said search specification control logic and to combine the best values for data block groups into a device result.

3,906,456
REAL-TIME INDEX REGISTER

James L. Redifer, Timonium, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1974, Ser. No. 435,376
Int. Cl.[2] H03K *23/00*
U.S. Cl. 340—172.5 **6 Claims**



1. A real-time index register for use in a computer comprising:

counting means;

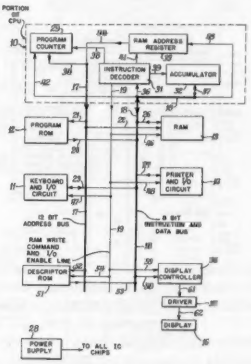
multiplexing means for providing an enable signal to step said counting means, said multiplexing means receiving a plurality of simultaneously available, different-frequency signals and one or more incrementing signals from iterative loops in said computer and permitting a selected one of these signals to pass as said enabling signal to said counting means; and

feedback means for applying the output from said counting means to said multiplexing means to enable or disable said multiplexing means from applying said enable signal to said counting means in accordance with the output from said counting means.

3,906,457
DISPLAY SYSTEM FOR AN ELECTRONIC BUSINESS MACHINE

Bruno A. Mattedi, Villa Park, and John J. Guagliardo, Chicago, both of Ill., assignors to Victor Comptometer Corporation, Chicago, Ill.

Filed Feb. 15, 1974, Ser. No. 443,125
Int. Cl.[2] G06F *3/14;* **G06K** *15/18*
U.S. Cl. 340—172.5 **6 Claims**



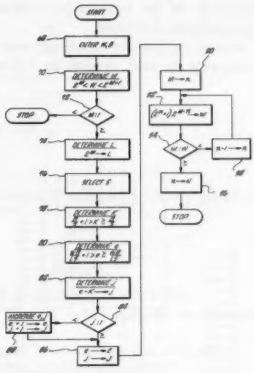
1. In an electronic business transaction system having keyboard means with a plurality of manually operable keys for producing both numeric and functional data signals, read-only memory means for storing addressable program instructions, random access memory means for storing addressable working transaction data, display means for visually displaying multiple characters indicating transaction data, digital processing means, address means connecting said processing means to address locations in both said memory means, and instruction and data transfer means connecting said processing means with said keyboard means, said display means and both said memory means; and wherein said processing means is operable to obtain and execute said instructions to perform arithmetic and logical operations to produce and display said transaction data in response to said data signals from said keyboard means, said processing means being further operable to select message address locations in response to operating conditions to be indicated; a display system comprising: descriptor memory means connected to said address means and said transfer means and operable to store and provide at said transfer means addressable coded message character signals, and display control means connecting said transfer means with said display means and having register means for storing said character signals, said processing means being operable in response to certain of said instructions to transfer said character signals from said descriptor memory means to said register means by means of said transfer means, said display control means being operable to drivingly connect said stored character signals to said display means for visually displaying transaction messages; whereby said single display means is operable to visually display both numeric and message transaction data.

3,906,458

ODD-SIZED MEMORY HAVING A PLURALITY OF EVEN-SIZED STORAGE ELEMENTS OF THE SAME CAPACITY

Randall Gordon Ehlers, San Jose, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 28, 1974, Ser. No. 501,235
Int. Cl.[2] G11C *13/00*
U.S. Cl. 340—172.5 **31 Claims**



25. A Class N odd-sized memory section for storing segments of at least W individually addressable words, W being an integer greater than 2^M but less than 2^{M+1}, M being an integer greater than zero, and N being an integer greater than zero but no greater than M; wherein the memory section is organized for addressing into an array of R rows and C columns, R being equal to 2^N+1 and C being an integer greater than zero but no greater than 2^N, each column having a word segment in each individually addressable location thereof and each row having 2^{M-N} individually addressable locations of length C word segments each; and wherein the array is partitioned into a base array portion comprising 2^N of the rows and an expansion array portion comprising the remaining row not included in the base array portion; the memory section comprising, in combination:

a. means for generating a memory address signal for the memory section wherein the memory address signal has a length of M+1 bits partitioned into a common address signal comprising the M—N least significant bits thereof, an expansion address signal comprising the most significant bit thereof, and a row address signal comprising the N bits thereof intermediate the most significant bit and the M—N least significant bits, wherein the expansion address signal has a first state effective for selecting the addressable locations of the base array portion for access and a second state effective for selecting the addressable locations of the expansion array portion for access, and wherein the row address signal has 2^N possible states, each one of which is effective for selecting a different one of the rows of the base array portion for access;

b. C+1 storage elements each having 2^M individually addressable storage locations for word segments therein, each storage element also having addressing means operatively associated therewith for responding to an M—bit element address signal supplied thereto to identify a storage location for access, and each storage element further having enabling means operatively associated therewith for responding to an enabling signal applied thereto to enable access to an identified storage location, said storage elements being grouped into a first set comprising C base storage elements, each one of which is reserved for storing word segments associated with a different specific column of the array, and a second set comprising one expansion storage element;

c. means responsive to the expansion address signal for supplying an enabling signal to said expansion storage element only when the expansion address signal is in its first state whereby said expansion storage element is reserved for storing word segments situated in the base array portion;

d. means responsive jointly to the expansion address signal and the row address signal for supplying an enabling signal to each one of said base storage elements when the expansion address signal is in its first state for all but one selected one of the 2^N possible states of the row address signal, a different state of the row address signal being selected to be effective for the absence of the enabling signal for each different one of said base storage elements whereby each base storage element has 2^{M-N} storage locations therein selected to be unavailable for access when the expansion address signal is in its first state; and

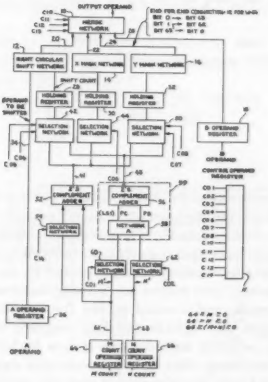
e. means for supplying an M-bit element address signal to said storage elements wherein the element address signal comprises the common address signal for the M—N least significant bits thereof and the row address signal for the N most significant bits thereof when the expansion address signal is in its first state.

3,906,459

BINARY DATA MANIPULATION NETWORK HAVING MULTIPLE FUNCTION CAPABILITY FOR COMPUTERS

Daniel J. Desmonds, Roseville; Donald P. Tate, and Douglas A. Robbins, both of St. Paul, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 3, 1974, Ser. No. 475,533
Int. Cl.[2] G06F *13/00*
U.S. Cl. 340—172.5 **9 Claims**



1. A binary data manipulation network for performing a preselected function from a group of predetermined functions, comprising:

a merge network which produces an output operand, said merge network being responsive to predetermined control signals dependent on the preselected function to be performed,

a shift network connected with said merge network for altering the bit position of the bits in an operand, said shift network producing an output operand which constitutes a first input to said merge network.,

means for providing as an input to said shift network a first data operand,

a first mask network connected with said merge network, producing an output masking pattern, which constitutes

a second input to said merge network, in response to a first input count operand,

a first means for providing an input count operand, as an input to said first mask network,

a second mask network connected with said merge network, producing an output masking pattern which constitutes a third input to said merge network, in response to a second input count operand,

a second means for providing an input count operand as an input to said second mask network, and

means for providing as a fourth input to said merge network second data operand.

3,906,460

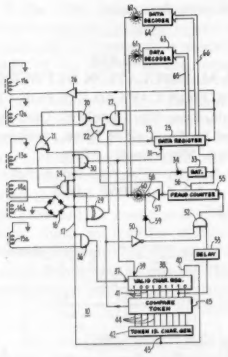
PROXIMITY DATA TRANSFER SYSTEM WITH TAMPER PROOF PORTABLE DATA TOKEN

John W. Halpern, 980 Ignacio Blvd., Apt. 11, Novato, Calif. 94947

Filed Jan. 11, 1973, Ser. No. 322,669

Int. Cl. G07f *7/02*; **G06k** *11/14*, *19/00*

U.S. Cl. 340—172.5 **32 Claims**



1. In a portable data storage token having an active data register for containing variable data; coupling means including means for reading data from said register, means for manifesting data read from said register externally of said data storage taken, means for sensing data generated by an external data transfer device, and means for sensing externally generated control signals; and control means for enabling transfer of data between said register and said coupling means; the improvement wherein said control means includes means for normally inhibiting data flow between said data register and said external data transfer device and said data storage token further includes testing means coupled to said sensing means and said control means and responsive to the receipt of an externally generated predetermined validation character signal for generating a signal for disabling said inhibiting means to permit data flow between said data register and said external data transfer device.

3,906,461

INTEGRATED MNOS MEMORY WITH DECODER

Arthur M. Cappon, Boston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,091

Int. Cl.[2] **G11C** *11/40*

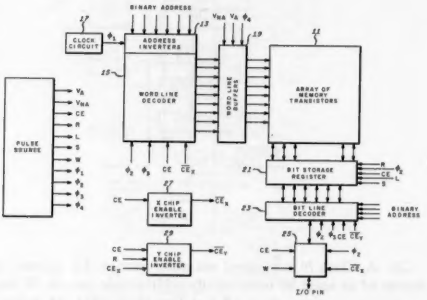
U.S. Cl. 340—172.5 **9 Claims**

1. A digital memory system comprising

an array of variable threshold insulated gate field effect memory transistors having source, drain and gate electrodes, said memory transistors being arranged in word rows and bit columns on a common substrate,

said memory transistors being characterized in that they display a conduction threshold which may be shifted to a high level by the application of a WRITE voltage across the gate insulator of the transistor and to a low level by the application of an inverted WRITE voltage across the gate insulator, said transistors being further characterized in that information may be read out of said transistor by application of an intermediate-valued READ voltage across the gate insulator,

pulse source means for applying sequential voltages to components in said system in a four-phase operating



sequence consisting of load, reset, clear, and store phases,

word-line and bit-line decoder means for addressing a selected memory transistor in said array,

buffer means responsive to the output of said word-line decoder for applying suitable gate voltages to individual rows of memory transistors,

bit storage register means including individual flip-flop means corresponding to each bit column for temporarily storing information read out of the addressed memory transistor in the associated column during said load phase and writing information back into addressed memory transistors during said store phase,

input-output circuit means for coupling external circuits to individual flip-flops in said bit storage register in accordance with address signals from said bit line decoder,

said buffer means including individual transistor pairs

3,906,462

OPTICAL STORAGE DEVICE USING PIEZOELECTRIC READ-OUT

Julius Feinleib, Cambridge, and Stephen G. Lipson, Belmont, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed May 4, 1973, Ser. No. 357,290

Int. Cl. G11c *11/42*

U.S. Cl. 340—173 LS **16 Claims**

1. A light readable device comprising:

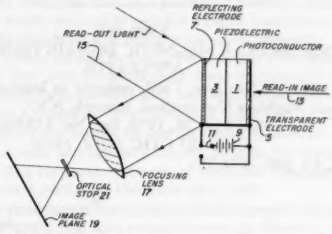
a. a piezoelectric medium which undergoes dimensional change in response to an electric field impressed thereacross;

b. means for impressing an electric field across said piezoelectric medium, said electric field being representative of information;

c. means for illuminating said piezoelectric medium with

read-out light; and,

d. means for sensing modulations of the read-out light



caused by dimensional changes in said piezoelectric medium

3,906,463

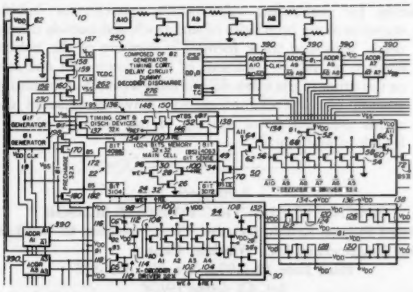
MOS MEMORY SYSTEM

Robert Tapei Yu, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,360

Int. Cl.[2] G11C *11/40*

U.S. Cl. 340—173 R **11 Claims**



1. A semiconductor chip including a fully decoded MOS memory system including a plurality of memory cells, a row decoding circuit, a plurality of address buffer circuits, a data input circuit, and a data output circuit comprising:

X subarrays of memory cells each arranged as 2^M to the M power rows and 2 to the N columns;

said row decoding circuit being coupled to each of said X subarrays for selecting a predetermined one of said 2 to the M rows of memory cells;

a column decoding circuit for selecting one of said 2 to the N columns in each of said X subarrays, coupled, respectively, to each of said X subarrays;

said column decoding circuit including X subsections, each coupled to one of said X subarrays for independently selecting one of said 2 to the N columns of said subarray independently of said remaining subarrays;

a subarray selection circuit for selecting one of said X subarays;

each of said subarrays being coupled to said data input circuit and said data output circuit.

3,906,464

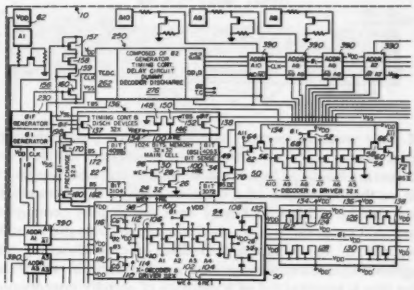
EXTERNAL DATA CONTROL PRESET SYSTEM FOR INVERTING CELL RANDOM ACCESS MEMORY

William Walter Lattin, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,715

Int. Cl.[2] G11C *11/40*

U.S. Cl. 340—173 R **7 Claims**



1. A random access memory comprising an array of inverting storage cell means for storing a logic state therein and inverting said logic state stored in said inverting storage cell means when said inverting storage cell means is sensed and a plurality of data control cells coupled to said storage cell means, and preset means coupled to said data control cell means for presetting the state of said data control cells.

3,906,465

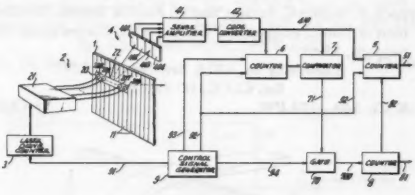
HOLOGRAM GRAPHIC DATA TABLET APPARATUS USING A VERNIER

Masahiro Moriwaki; Mitsuhito Sakaguchi, and Yoshinari Mita, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 499,975

Int. Cl.[2] G02B *27/00*

U.S. Cl. 340—173 LM **5 Claims**

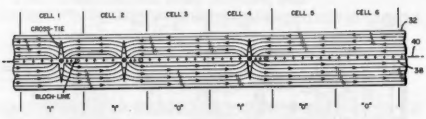


1. A hologram graphic data tablet apparatus comprising a hologram plate having a plurality of position-representing mini-holograms recorded thereon, a reference laser, an array of n or $(n-1)$ vernier lasers arranged at an interval of $(n-1)/n$ of the width of one of said mini-holograms, means for energizing said reference and said vernier lasers in a predetermined time sequence, means for detecting the light rays emitted by said lasers and diffracted at said mini-holograms forming a reconstructed image, and means for processing the output of said detecting means to produce a positional code having a greater number of bits than the positional code obtained directly from said mini-holograms depending on whether the output codes from said detecting means are the result of irradiation by said reference laser or by said vernier laser array.

3,906,466
PROPAGATION CIRCUIT FOR CROSS-TIE WALL MEMORY SYSTEM

David S. Lo, Burnsville, and Maynard C. Paul, Bloomington, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 9, 1974, Ser. No. 495,971
Int. Cl.[2] G11C *11/15, 19/08*
U.S. Cl. 340—174 TF **1 Claim**



1. In a cross-tie memory system in which binary data are stored as inverted Neel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, of a cross-tie wall in a ferromagnetic layer and in which said binary data are serially propagated along said cross-tie wall by the interacting fields provided by a microstrip and a superposed drive line sandwiching said magnetic layer therebetween, the improvement in which said drive line is constructed of a plurality of serially-intercoupled portions that are uniformly spaced along said cross-tie wall, each of which portions defines a memory cell in the associated area of said magnetic layer and along said cross-tie wall, each of said portions comprising:

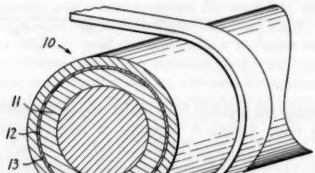
a transfer segment and a memory segment aligned along said cross-tie wall intercoupled for providing, when current energized, respectively associated localized fields in the plane of said magnetic layer, which fields are anti-parallel to each other and normal to said cross-tie wall;

keepers of high magnetic remanence associated with said transfer segment and said memory segment for providing localized fields, at their ends, that are normal to the plane of said magnetic layer and that stabilize the positions of the cross-tie and the Bloch-line of an inverted Neel wall section at the respective ends of said keepers that are associated with said transfer segment and said memory segment.

3,906,467
PLATED WIRE MEMORY

Francis P. Velishek, Savage, and G. Patrick Bonnie, Richfield, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed May 14, 1973, Ser. No. 360,227
Int. Cl.[2] G11C *11/155*
U.S. Cl. 340—174 PW **6 Claims**

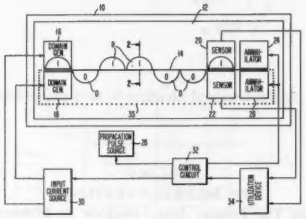


1. An elongated memory element comprising an elongated core having an outer surface, said core being contructed of non-magnetic conductive material, a first continuous layer of conductive material disposed over said outer surface of said core, a second continuous layer of conductive material disposed over said first layer so that said first layer is sandwiched between said core and said second layer, and a third continuous layer of magnetic material disposed over said second layer so that said second layer is sandwiched between said first and third layers, the material forming said second layer entirely separating said first and third layers and being of a type which does not diffuse toward the magnetic material forming said third layer.

3,906,468
SEMICIRCULAR MAGNETIC DOMAIN PROPAGATION APPARATUS

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1974, Ser. No. 473,952
Int. Cl.[2] G11C *11/14, 19/08*
U.S. Cl. 340—174 TF **6 Claims**



1. A magnetic domain arrangement comprising:

a host magnetic medium in which bubble domains can be moved;

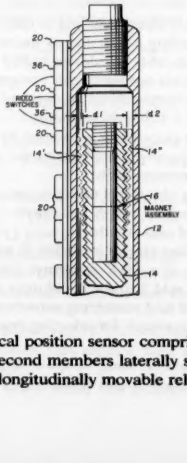
a track comprising a magnetic discontinuity formed in said host medium; and

means for generating substantially semicircular bubble domains along both sides of said track and outside of said track, with said track forming a segment of the bubble domain boundary, locations of the domains on one side or the other of the track determining a binary information storage bit, wherein interaction between adjacent domains provides serial spacing of the domains along a length of said track.

3,906,469
MAGNETIC-ELECTRIC POSITION SENSOR

Richard Eugene Kronk, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 12, 1973, Ser. No. 369,325
Int. Cl. G08c *19/04*
U.S. Cl. 340—188 R **13 Claims**



1. An electrical position sensor comprising:

a. first and second members laterally spaced from one another and longitudinally movable relative to one another

along a path substantially parallel said members in accordance with a condition to be sensed:

b. electrical signal providing means including a plurality of magnetic flux responsive devices positioned in close succession along said first member in the direction of said relative longitudinal motion, each device responsive to a threshold magnetic flux of a particular intensity and extending axially thereof to provide a signal indicative of at least said threshold flux being interactive therewith;

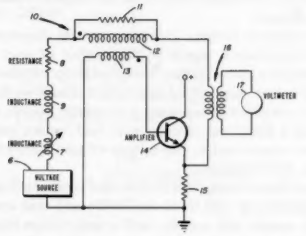
c. magnet means carried by said second member and spaced laterally from said flux responsive devices proportional to said spacing between said first and second members for providing a magnetic field having an axial flux along at least part of the length of and beyond the ends of said magnet means and laterally thereof at least the distance to said flux responsive means of sufficient intensity to provide said particular threshold flux; and

d. flux controlling means carried by said second member and positioned near said magnet means for reducing said axial flux beyond the ends of said magnet means and at said lateral distance to said flux responsive means to an intensity less than said threshold value.

3,906,470
MECHANICAL-ELECTRICAL TRANSDUCER GAUGE PROVIDED WITH A CIRCUIT FOR MAKING LINEAR THE RESPONSE OF THE GAUGE

Cesare Anichini, Florence, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed June 20, 1973, Ser. No. 371,686
Claims priority, application Italy, June 28, 1972, 3472/72
Int. Cl. G08c *19/06*
U.S. Cl. 340—195 **3 Claims**



1. A transducer gauge for measuring a physical quantity through measurement of an electrical quantity depending on the physical quantity, comprising:

a. a voltage source;

b. an inductive transducer connected in a series circuit fed by the voltage source, the transducer having an impedance depending in a nonlinear way on said physical quantity; the total impedance of the circuit being representable by impedance elements linearly variable with the physical quantity and impedance elements independent of variations of the physical quantity;

c. measuring means for measuring the transducer current;

d. a compensating circuit for compensating the defects of linearity of the elements of said series circuit, said compensating circuit including:

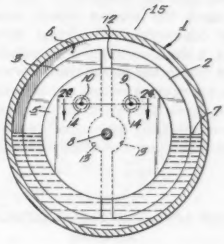
d_1. a transformer having a primary coil and a secondary coil, the primary coil being connected in series in said series circuit and having a resistance connected in parallel;

d_2. amplifier means having an input connected with said secondary coil and an output coupled with said series circuit, for generating on said output a compensation voltage equal as to the absolute value and opposed in phase with respect to the total voltage across said impedance elements independent of variations of the physical quantity, whereby said transducer current is linearized with respect to variations of the physical quantity.

3,906,471
HIGH SIDE METER

Elbert N. Shawhan, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 12, 1973, Ser. No. 396,627
Int. Cl.² G08C *19/10*
U.S. Cl. 340—200 **17 Claims**

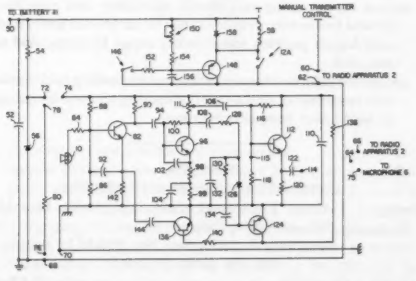


1. In a telemetering system, an inclination sensing arrangement comprising: a sealed housing; means in the housing providing first and second capacitances; dielectric means in said housing for varying the value of said first capacitance in response to variations in the value of inclination, whereby the value of said first capacitance is representative of the value of said inclination; circuit means for generating a rectangular vave voltage; and circuit means coupling said first and second capacitances to said generating circuit means, for varying the time duration of one polarity of said rectangular wave voltage in proportion to said first capacitance.

3,906,472
VEHICLE SAFETY AND CRIME DETERRENT COMMUNICATION SYSTEM

Joseph G. Guadara, and William R. Wesserling, both of North Bergen, N.J., assignors to Sav-A-Life Corporation, Union City, N.J.

Continuation-in-part of Ser. No. 290,264, Sept. 18, 1972, abandoned. This application June 26, 1974, Ser. No. 483,459
Int. Cl.² H04B *01/44*; **G08B** *25/00*
U.S. Cl. 340—224 **7 Claims**



1. A system for communicating between a vehicle and a remote station, comprising:

radio apparatus including at least a transmitter carried by the vehicle;

first and second microphones selectively operable by an operator of the vehicle for communicating with the remote station:

the first microphone arranged for being held by the operator when in use;

the second microphone discretely disposed within the vehicle;

a first normally open switch connected to the first microphone and the transmitter and supported by said microphone, and operator-operable for being closed to connect the first microphone to the transmitter;

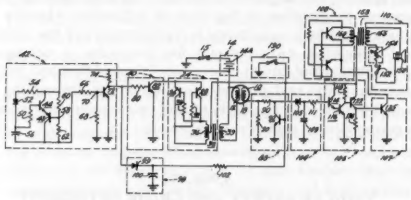
a second normally open switch connected to the second microphone and supported within the vehicle, and operator-operable for being closed; and

circuit means connected to the second switch, the second microphone and the transmitter, and including means effective upon the second switch being momentarily closed for connecting the second microphone to the transmitter, a third normally open switch, and time control means connected to the third normally open switch and to the connecting means and affecting said connecting means upon the third switch being momentarily closed for maintaining the second microphone connected to the transmitter for a predetermined interval.

3,906,473
METHOD AND APPARATUS FOR OPERATING A GAS SENSOR

Harris D. Le Vine, Albany, N.Y., assignor to Will Ross, Inc., Glendale, Wis.

Filed Mar. 8, 1974, Ser. No. 449,474
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—237 R **13 Claims**



4. Apparatus for sensing gases, comprising:

a gas sensor of the class which is modified conductively by contact with a given first class of gases when operated in a lower temperature range and which purges itself of said gases and restores itself toward original conductivity when operated in a temperature range higher than said lower temperature range;

means for operating said sensor alternately and repetitively in said lower temperature range to sense said gases and in said higher purging temperature range to purge said sensor; and

means for selectively measuring and indicating said conductive response of said sensor occurring when it is operated in said lower temperature range.

3,906,474
COMBUSTION PRODUCTS ALARM

George S. Lehsten, Englewood, Colo., assignor to Fire Alert Company, Wheat Ridge, Colo.

Filed May 7, 1973, Ser. No. 358,111
Int. Cl. G08b 17/10
U.S. Cl. 340—237 S **3 Claims**

1. A combustion product detector of the ionization chamber type comprising:

a. a reference ionization chamber and a sampling ionization chamber connected in series,

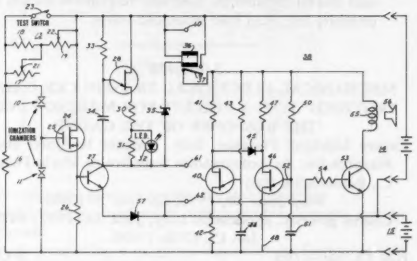
b. means including a variable resistor for connecting said chambers in series therewith across circuit terminals for connection to a direct current supply,

c. a field effect transistor having source and drain and gate terminals, said gate terminal being connected to the junction between said chambers, and said source and drain terminals being connected across said circuit terminals in series with an output resistance, said field effect transistor being responsive to potential changes across said sampling chamber for providing a signal in proportion thereto, and

d. means dependent upon a first predetermined signal at the output of said field effect transistor for indicating the approach of an alarm condition, and

e. means dependent upon a second predetermined signal at the output of said field effect transistor for initiating an alarm indication,

said means dependent on a first predetermined signal at the output of said field effect transistor further including a light emitting element and an oscillator for repetitively energizing said element beginning upon occurance of the first predetermined signal at the output of said field effect transistor and continuing through attainment of the sec-



ond predetermined signal at the output of said field effect transistor,

said detector further including means dependent upon a predetermined signal at the output of said field effect transistor for utilizing said signal to produce an alarm indication, said signal dependent means including a control amplifier comprising a transistor connected in series with a third resistance across said source and having its base connected to the output of said field effect transistor, and wherein:

the oscillator comprises a capacitor connected in series with a portion of said third resistance and said control amplifier across said supply, and a unijunction transistor connected in series with another portion of said third resistance across said first portion and said capacitor and with its emitter connected to the junction of said capacitor and said first portion, and

the light emitting source comprises a light emitting diode connected in parallel with at least a portion of said third resistance between said unijunction transistor and said control amplifier.

3,906,475
POWDER LEVEL MONITOR

Jacob C. Rubin, Fairport, and John P. Swapceinski, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

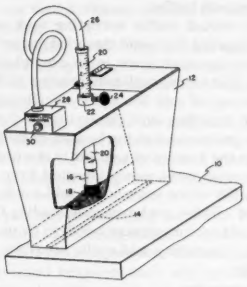
Filed May 16, 1974, Ser. No. 470,411
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—246 **5 Claims**

1. Apparatus for monitoring the presence or absence of powder at a predetermined level within a hopper, said hopper being located in a noisy environment, said apparatus consisting of:

a. a microphone disposed at a predetermined level within the hopper and responsive to environmental noise transmitted through the hopper to the interior thereof to produce a signal having a component proportional to the

amplitude of the environmental noise at the predetermined level within the hopper;

b. means for supporting said microphone at said predetermined level within the hopper; and



c. means coupled to said microphone and responsive to a decrease in the amplitude of said signal for indicating the absence of powder at the predetermined level within the hopper.

3,906,476

WARNING SYSTEM

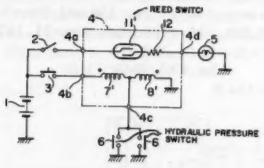
Hisashi Yonezu, Oobu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 17, 1973, Ser. No. 389,156

Claims priority, application Japan, Aug. 21, 1972, 47-83450; Feb. 6, 1973, 48-15291; May 10, 1973, 48-52193

Int. Cl.[2] G08B *21/00;* **B60Q** *1/00*

U.S. Cl. 340—253 R **8 Claims**



1. A warning system comprising a self-holding type reed switch having contacts which close upon application of an external magnetic field and which are retained in said closed position even after the removal of said external magnetic field, a first coil for producing a magnetic field sufficient to close said reed switch, a second coil for producing a magnetic field whose direction is opposite to that of the magnetic field of said first coil wherein the strength of the resultant magnetic field of the magnetic fields of the first and second coils is not sufficient to close said reed switch when in the open position, but is sufficient to open said reed switch when in the closed position, a sensor switch means connected to a power supply through said first coil which senses a fault condition, and a warning means connected to said reed switch.

3,906,477

FAULT INDICATOR IN TEST POINT CAP

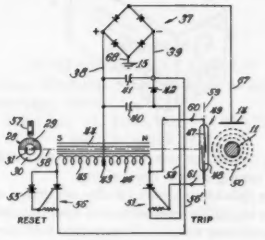
Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60062

Filed Sept. 6, 1974, Ser. No. 503,719

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—253 A **16 Claims**

1. Means responsive to flow of alternating fault current in and high voltage energization of a conductor comprising: means for responding to current flow in said conductor, first and second capacitor means, rectifier means, conductive circuit means for directly interconnecting said first and second capacitor means in parallel and said conductor through said rectifier means to charge said first and second capacitor means to a unidirectional voltage, and fault indicating means including: a target, a magnetic core, a trip winding on said core connected to be energized from said first capacitor



means in response to operation of said current flow responsive means for moving said target from a non-indicating position to a fault indicating position in response to flow of fault current in said conductor, and a reset winding on said magnetic core connected to be energized from said second capacitor means for moving said target from said fault indicating position to said non-indicating position on application of energizing voltage to said conductor.

3,906,478

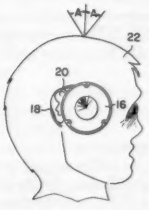
SLEEP PREVENTING DEVICE

John L. Smey, 38 Riverview Cir., Fairfield, Conn. 06430

Filed May 30, 1974, Ser. No. 474,709

Int. Cl.[2] G08B *5/00*

U.S. Cl. 340—279 **2 Claims**



1. A sleep prevention device, comprising:

a hollow shallow cylindrical member having an inner flat perforated surface and an outer surface in the form of a sound collecting diaphragm;

ear engaging means secured to the inner surface and designed to detachably engage an ear of the user to secure the member thereto, whereby sound may be collected by the diaphragm and transferred to the ear via the member without being blocked;

a battery in the member;

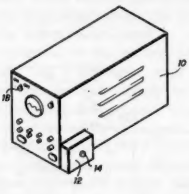
an electric buzzer in the member; and

a normally open mercury containing tilt switch in the member connected in series with the battery and buzzer and being closed when the head of the user tilts at least 40° with respect to the vertical.

3,906,479
TIME INTERVAL COMPUTER

Troy W. Fitch, Greenville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 15, 1974, Ser. No. 451,430
Int. Cl.[2] G08B 5/38
U.S. Cl. 340—309.1 12 Claims

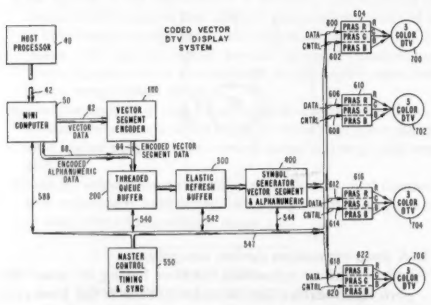


1. A timing circuit for use with an electrochemical storage element, said timing circuit comprising:
an oscillator providing a periodically occurring drive signal;
an output transistor connected to said oscillator;
an enable switching means connected to said output transistor, said enable switching means being controlled by the operation of the storage element, the storage element being operable after a predetermined cumulative period of recurrent energization for exhibiting a change in an electrical characteristic thereof, said enable switching means being responsive to said change for enabling conduction of said output transistor in accordance with said periodically occurring drive signal; and
alarm means connected to said output transistor and periodically actuated in accordance with the conduction cycle of the output transistor.

3,906,480
DIGITAL TELEVISION DISPLAY SYSTEM EMPLOYING CODED VECTOR GRAPHICS

Alfred Alexander Schwartz, Gaithersburg, Md., and Joseph Robert Stewart, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1973, Ser. No. 335,388
Int. Cl. G08b 5/36
U.S. Cl. 340—324 AD 8 Claims

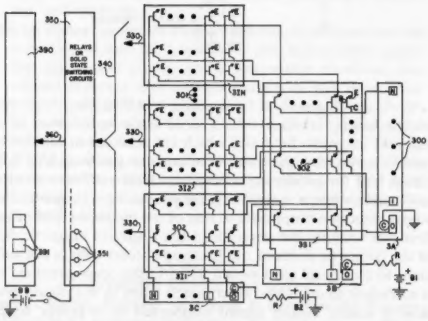


1. A digital television display system having an input connected to the output of a data processor which outputs data to said display system describing the origin, slope and length of a vector to be represented, and an output connected to the input of a digital television monitor for receiving a pattern of raster illumination signals from said display system, comprising in combination:
a vector segment encoder;
said vector segment encoder accepting said data from said data processor, decomposing said vector into a connected sequence of vector segments, and encoding said segments as vector segment words containing coordinate, length and symbol code data;
a threaded queue buffer;
said threaded queue buffer accepting said vector segment words outputted from said words into threaded queues of common raster line value;
an elastic refresh buffer;
said elastic refresh buffer accepting said vector segment words outputted from said threaded queue buffer, storing said vector segment words in an expandable list ordered by raster line value, cyclically reading said vector words from the top of said list and cyclically outputting each word for decoding and displaying, and rewriting each vector segment word at the bottom of said list, cyclically writing at the bottom of said list in the order of Y value, new vector segment words inputted from said threaded queue buffer while suspending said cyclic reading from the top of said list, and cyclically reading from the top of said list, old vector segment words to be purged from said list while suspending said cyclic rewriting at the bottom of said list;
a symbol generator;
said symbol generator accepting vector segment words cyclically outputted by said elastic refresh buffer, decoding each vector segment word, and generating a pattern of raster illumination signals corresponding to each vector segment to be displayed;
a raster assembly storage;
said raster assembly storage accepting from said symbol generator said outputted pattern of raster illumination signals and assembling said signals in synchronism with said cyclic operation of said elastic refresh buffer, for output to and display on said digital television monitor.

3,906,481
TRANSISTOR NETWORK FOR INFORMATION STORAGE AND RETRIEVAL

Paul P. Luger, Spokane, Wash., assignor to The Pioneer Educational Society, Portland, Oreg.

Continuation-in-part of Ser. No. 238,042, March 27, 1972, Pat. No. 3,803,581. This application Sept. 21, 1973, Ser. No. 399,474
Int. Cl.[2] G06K 15/18
U.S. Cl. 340—324 R 11 Claims



1. In an electric product indicating network for obtaining products of multiplicands and multipliers, said network comprising:
a. a first basic switch member having one movable contact and several stationary contacts,
b. a second basic switch member having one movable contact and several stationary contacts;
c. an array of transistors arrangeable in rows and columns, each said transistor having a first, a second and a third transistor connection;
d. said first connection of each said transistor in each said column in said array being interconnected, and each said

interconnected first connection of each said column being connected to one said stationary contact of first said basic switch member;

e. said second transistor connection in each said row in said array being interconnected, and each said interconnected second transistor connection of each said row being connected to one said stationary contact of said second basic switch member;

f. said third transistor connection of each said transistor of said transistor array being a product-representing-terminal for the two positions of said first and said second basic switch member;

g. product indicating devices for representing numerical digits each having electric connections;

h. a first and a second source of electric power potential;

i. said product-representing-terminals that represent the same product being interconnected to form contact unions, said product-representing terminals that represent unique products also being called contact unions;

j. current isolation devices, one said current isolation device being connected between each said product indicating device and each said contact union;

k. permitting, however, one such connection to each of all said product indicating devices to be directly connected without an intervening said current isolation device;

l. one said electric connection of each said product indicating device being interconnected and also connected to a terminal of said first source of electric potential; a second terminal of said first source of electrical potential being connected to said movable contact of said second basic switch member; and,

m. said second source of electric potential being connected between said moving contact of said first basic switch member and said moving contact of said second basic switch member.

3,906,482

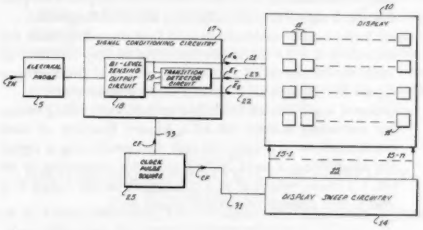
BINARY-SIGNAL DISPLAY EMPLOYING A MATRIX OF ILLUMINATIVE ELEMENTS

Ralph Morrison, 2787 Yorkshire Rd., Pasadena, Calif. 91107

Filed Mar. 6, 1974, Ser. No. 448,679

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 R **11 Claims**



1. Apparatus for providing a progressive display of a pulse pattern being defined by a time-varying, binary-valued electrical input signal, which comprises:

a display including a plurality of electrically-controllable illuminative elements arranged in a matrix having at least first and second rows and a plurality of columns;

a source of sequentially occurring pulses;

display sweep circuitry including circuit means responsive to the pulses for generating in parallel a plurality of time-varying, binary-valued control signals that together define a column addressing signal that one-by-one identifies each column;

means, including an electrical probe sensing the electrical input signal and a bi-level sensing circuit responsive thereto, for providing a row addressing signal that varies in time in accordance with the electrical input signal to identify the first row when a first binary value is sensed and to identify the second row when a second, opposite binary value is sensed; and

circuit means responsive to the row addressing signal and the column addressing signal for causing illuminative elements to light when both the row and column in which they are arranged are identified so as to produce a visual display corresponding to the pulse pattern being defined by the input signal.

3,906,483

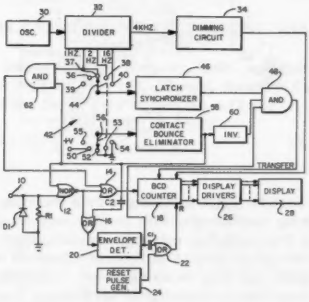
COMPASS DISPLAY CIRCUIT

John T. Fowler, Winthrop, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Jan. 21, 1974, Ser. No. 434,793

Int. Cl.² G09F *9/32*

U.S. Cl. 340—336 **7 Claims**



1. For use with a digital magnetic compass providing a serial pulse train representative of compass heading, display circuitry for converting received serial pulses to a parallel form for driving output indicators for selective numerical display of compass heading and elapsed time, said circuitry comprising:

a clock source providing clock pulses at a predetermined frequency;

a divider circuit operative in response to said clock pulses for providing a plurality of timing pulse trains of respective different frequencies;

means for receiving said serial pulses from a digital magnetic compass;

envelope detector means operative to provide a gating signal of a duration corresponding to the duration of said received serial pulses;

counter means operative in response to said received serial pulses and said gating signal to provide parallel output signals representative of magnetic compass heading;

selector means operative to select one of said timing pulse trains;

a dimmer circuit operative in response to one of said timing pulse trains to provide output signals of selectable pulse width and coupled to said counter means for control of the blanking rate thereof;

synchronizing means coupled to said counter means and operative in response to one of said timing pulse trains to synchronize processing of said received serial pulses and timing pulse trains;

means coupled to said selector means and to said envelope detector means for inhibiting signal processing in the presence of contact bounce noise;

means operative in response to one of said timing pulse trains for providing said selected pulse train to said counter means to the exclusion of said received serial pulses to cause provision by said counter means of parallel output signals representative of elapsed time; and

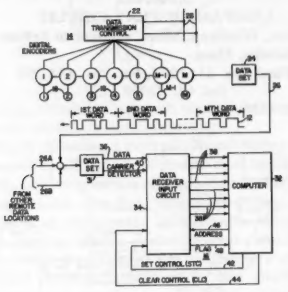
display means operative in response to said parallel output signals for providing a numerical indication of compass heading or elapsed time.

3,906,484

DECODER INPUT CIRCUIT FOR RECEIVING ASYNCHRONOUS DATA BIT STREAMS

Waymon A. Melvin, Jr., Erwin, and George W. Lipscomb, Raleigh, both of N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1972, Ser. No. 288,863
Int. Cl.² H04J *3/06;* **H04L** *7/02*
U.S. Cl. 340—347 DD **9 Claims**



1. A decoder input including a data receiving circuit for maintaining synchronism with continuously received binary encoded data including regularly occurring start and end of word information subject to random omissions of said start information, said data receiving circuit, comprising:

data input means receiving an isochronous data bit stream characterized by a continuous series of binary coded data words having a common N number of data bits including start and end bits of first and second binary states, respectively, and wherein the interval of each data bit is subject to small variations relative to a predetermined data bit interval;

internal clock means continuously generating multiphase clock pulses in a predetermined order including first, second and third phase clock pulses consecutively occurring during an interval substantially equal to said predetermined data bit interval, and wherein said multiphase clock pulses have commonly adjustable phase relationships relative to each interval;

storage register means recurrently entering each of N data bit intervals occurring at said data input means under shifting control of said second phase clock pulses;

pulse counter means responsive to said second phase clock pulses and recurrently counting from a first count to an N number count of said second phase clock pulses;

logic control circuit means firstly responsive to said third phase clock pulses when coincident with said N number count of said pulse counter means and secondly responsive to said first phase clock pulses when coincident with a first count of said pulse counter means;

enabling circuit means developing an enabling pulse controlled by said logic control circuit means such that said enabling pulse extends between the consecutive occurrences of said firstly and secondly named responses of said logic control circuit means; and

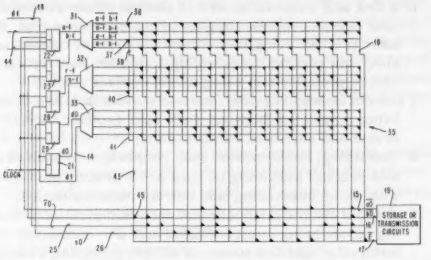
synchronizing circuit means generating a synchronizing pulse effective to coincidently adjust the phase relationships of said multiphase clock pulses in response to the transition from the second to the first binary state at said data input means when the last named transition is coincident with said enabling pulse such that the interval of each of said start data bits is synchronized with a second phase clock pulse at said storage register means and upon absence of one of said start bits the data word associated therewith is entered into said storage register in synchronism with the last previous data word containing a start data bit.

3,906,485

DATA CODING CIRCUITS FOR ENCODED WAVEFORM WITH CONSTRAINED CHARGE ACCUMULATION

Se J. Hong, and Daniel L. Ostapko, both of Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 13, 1973, Ser. No. 369,675
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **10 Claims**



6. A zero modulation encoder, comprising,

means providing a data bit to be encoded and a plurality of adjacent data bits, said bits appearing as any one of 2^{n+1} combinations, where n is the number of adjacent bits,

a plurality of logic means each connected to receive the data bit to be encoded, the adjacent data bits, and a signal for identifying the existing state of the encoding operation, and each having means for producing a code bit pair and a signal for identifying the resulting state of the encoding operation, said plurality of logic means including,

first logic means operable in a first encoding state for encoding a data bit in a first binary fraction of said combinations as a code bit pair and producing a signal for identifying a second coding state,

second logic means operable in said first encoding state for encoding a data bit in a second binary fraction of said combinations as a different code bit pair and producing a signal for identifying a third coding state,

third logic means operable in said first encoding state for encoding a data bit in a remaining binary fraction of said combinations as a code bit pair and producing a signal for identifying a fourth coding state and

additional logic means operable in other encoding states for encoding a data bit of a binary fraction of said combinations as a code bit pair and producing a signal for identifying a next coding state for operating in an (R, C) code, where R is a run length in the range 4–6 and C is a charge constraint equal to 3.

3,906,486

BIPOLAR DUAL-RAMP ANALOG-TO-DIGITAL CONVERTER

Berry W. Phillips, Newtonville, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Continuation of Ser. No. 304,733, Nov. 8, 1972, abandoned. This application July 2, 1973, Ser. No. 375,683
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 NT **12 Claims**

1. A bipolar dual-ramp analog-to-digital converter of the type arranged to provide a digital output corresponding to the magnitude and polarity of an analog input voltage and including an analog processing stage having an integrator and comparator, the analog input voltage being applied to the integrator for a predetermined interval, and a reference voltage being applied to the integrator thereafter for a digitally measured

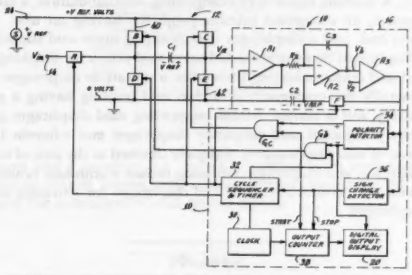
interval sufficient to restore the integrator to its initial condition, the comparator sensing the return of the integrator to the initial condition and signalling the end of the digitally measured interval, said converter being characterized by a reference circuit connecting the analog input voltage to the analog processing stage and comprising:

a capacitor coupling the analog input voltage to the analog processing stage;

a reference voltage source;

switch means for effecting connections between elements of said referencing circuit;

said switch means including means for connecting the reference voltage source to the capacitor to charge it to a voltage linearly related to the voltage of the reference voltage source and for thereafter disconnecting the capacitor from the reference voltage source;



said switch means including means for connecting the analog input voltage through the capacitor to the integrator during said predetermined interval, said analog input voltage thereby being biased by the capacitor voltage;

means for deriving from the reference voltage source a pair of derivative voltages linearly related thereto;

said switch means including means for connecting one of the derivative voltages to the analog processing stage to form a first reference voltage when the analog input voltage is of one polarity; and

said switch means including means for connecting the other of the derivative voltages, in series with the capacitor, to the analog processing stage to form a second reference voltage when the analog input voltage is of the other polarity;

whereby all of the voltages applied to the analog processing stage are directly or linearly referred to a single voltage source and any deviations therein balance one another over the course of an integrating cycle.

3,906,487
DIGITAL AGC FOR PLAYBACK OF DIGITALLY RECORDED DATA

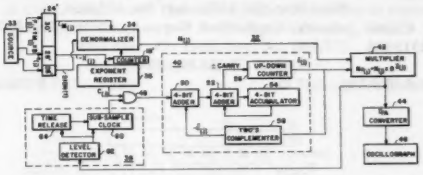
Lee E. Siems, Houston, Tex., assignor to Digital Data Systems, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 296,457, Oct. 10, 1972, abandoned. This application Aug. 13, 1974, Ser. No. 496,597
Int. Cl.² H03K *13/00*
U.S. Cl. 340—347 DA **9 Claims**

1. A digital AGC system for displaying electrical signals from a signal source, said signals having a wide dynamic range and a time-varying decay rate, consecutive samples of said signals being digitally represented by a series of consecutive floating-point numbers, each floating-point number consisting of an algebraic sign, a mantissa and an exponent to a base, the system including:

means to receive and to low-pass filter the absolute values of the exponents of selected ones of said consecutive floating point numbers thereby to generate from the filtered exponents corresponding exponential multipliers determined with respect to a preselected base;

means to receive and to denormalize the signed mantissas of said consecutive floating point numbers; and

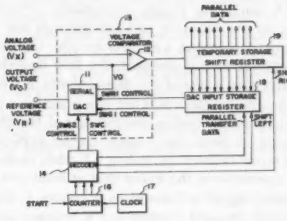


means to multiply the signed denormalized mantissas by the exponential multipliers corresponding to said consecutive floating-point numbers.

3,906,488
REVERSIBLE ANALOG/DIGITAL (DIGITAL/ANALOG) CONVERTER

Ricardo E. Suarez-Gartner, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 14, 1974, Ser. No. 442,581
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 C **22 Claims**



1. Apparatus for converting data between digital and analog forms, comprising

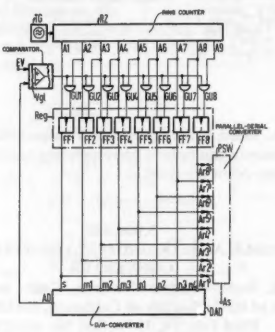
a digital store for receiving a digital number;

a switch controlled capacitor charge circuit including a ground reference terminal and voltage reference terminal, first and second capacitors having substantially matched characteristics and each having one plate connected to said ground reference terminal, a charge sharing switch operative at times to connect the other plates of said first and second capacitors, first switch means operative at times to selectively connect the other plate of said first capacitor to said ground and voltage reference terminals, and second switch means operative at times to connect the other plate of said second capacitor to said ground reference terminal; and control means connected to said digital store for providing an initial closure of said second switch means thereby discharging said second capacitor followed by alternate operation of said charge sharing switch and said first switch means for each digital number bit, said alternate operation including closure of said first switch means to select said ground reference terminal for a least remaining significant bit zero and to select said voltage reference terminal for a least remaining significant bit one, and closure of said charge sharing switch, whereby an analog voltage corresponding to said digital number is produced at the other plate of said second capacitor when a reference voltage is applied to said voltage reference terminal.

3,906,489
DIGITAL-TO-ANALOG CONVERTER

Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 28, 1974, Ser. No. 455,664
Claims priority, application Germany, Mar. 30, 1973, 2315986
Int. Cl. H03k 13/04
U.S. Cl. 340—347 DA 5 Claims



1. In a digital-to-analog converter for converting digital signals comprising $n+m+1$ bits each to analog signals with a non-linear characteristic consisting of 2^{m+1} linear segments, having 2^n amplitude stages comprising a coder operating according to the iterative process through the use of a first decoder circuit element, a second decoder circuit element and a third decoder circuit element, the first decoder circuit elements converting n bits of the digital signal in a resistor-ladder network having resistors that are adequate for a binay staggering of values to an analog control signal for the second decoder circuit element, the resistor-ladder network of the first decoder circuit element including a further resistor which can be made operative in the event that at least one of the m bits of the digital signal is formed by a binary 1, the second decoder circuit element comprising a resistor-ladder network having resistors that are adequate for a binary staggering of values, said resistors being made operative according to the value of the m binary bits of the digital signal and by said control signal, and the third decoder circuit element fixing the polarity of an output signal to be transmitted from the second decoder circuit element to a decoder output according to the remaining one bit in the digital signal, the improvement comprising:

a common resistance ladder network shared by said first and second decoder elements wherein all shunt and end resistances have substantially one and the same resistance value, all remaining resistances being of twice said one value,

constant current source means connected to n adjacent junction points formed by one of said remaining resistances and at least one said shunt resistance each, said n junction points being energized in accordance with n binary one bits of said digital signal,

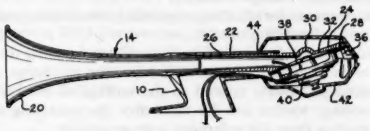
a second junction point adjoining said n junction points and formed by one of said remaining resistances and two of said shunt resistances, said second junction point being connected to be energized by said constant current in the event that at least one of m bits of the data signal is a binary one,

means for selectively connecting an output of said converter between one of said remaining resistances and at least one of said shunt resistances with one 2^m-1 junction points adjoining said junction points, said one junction point being determined by the value of the m binary one bits of the digital signal.

3,906,490
ELECTRIC HORN

Charles W. Shaw, Flora, Ill., assignor to Sparton Corporation, Jackson, Mich.

Filed Oct. 31, 1974, Ser. No. 519,508
Int. Cl.² G08b 3/10
U.S. Cl. 340—388 7 Claims

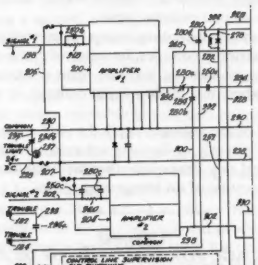


1. A warning signal horn comprising, in combination, a horn support, an elongated tubular projector having an axis, an open end, and a diaphragm end mounted upon said support, a diaphragm housing mounted upon said projector diaphragm end and communicating therewith, a vibratible diaphragm of generally flat configuration within said housing having a periphery and a center, means supporting said diaphragm periphery adjacent said projector diaphragm end wherein the plane of said diaphragm is obliquely diposed to the axis of said projector, and diaphragm vibrating means within said housing connected to said center of said diaphragm for vibrating said diaphragm.

3,906,491
ELECTRONIC ALARM AND EMERGENCY VOICE COMMUNICATION SYSTEM

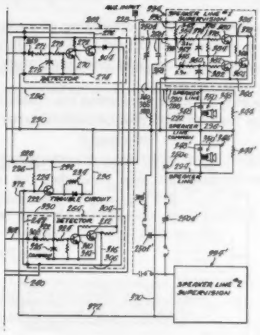
Earl W. Gosswiller, Clarendon Hills; Dick T. Hsu, Park Forest; Richard H. Williams, Wheeling, all of Ill., and Joel G. Iacono, Highland, Ind., assignors to Federal Sign and Signal Corporation, Chicago, Ill.

Filed May 14, 1973, Ser. No. 359,987
Int. Cl. G08b 29/00
U.S. Cl. 340—409 18 Claims



1. An alarm and emergency voice communication system comprising, in combination, alarm signal generating means continuously operable under normal conditions, voice communication means, amplifier circuit means, speaker circuit means, separate d.c. supervisory circuit means including a d.c. supervisory source, means connecting said voice communication means with said amplifier circuit means when said voice communication means is activated, switch means normally maintaining said alarm signal generating means connected with said amplifier circuit means, normally maintaining said amplifier circuit means disconnected from said speaker circuit means and normally maintaining said d.c. supervisory power

source connected to said speaker circuit means whereby an alarm signal is utilized to supervise said amplifier circuit

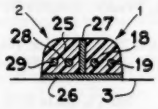


means and a separate d.c. signal is utilized to supervise said speaker circuit means, and control means responsive to an alarm for activation of said switch means.

3,906,492
SYSTEM FOR THE SURVEILLANCE OF OBJECTS MOVING ALONG A ROUTE

Jean-Raymond Narbaits-Jaureguy, and Henri Billottet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 2, 1973, Ser. No. 375,445
Claims priority, application France, July 7, 1972, 72.24748
Int. Cl.² G01S 9/00
U.S. Cl. 343—5 PD **5 Claims**



1. A system for the surveillance of objects moving along a route, comprising:

a radar installation provided with a source of outgoing high-frequency signals, transmission means connected to said source for emitting said outgoing signals, reception means for signals reflected by extraneous objects on said route, and indicator means for reflected signals connected to said reception means;

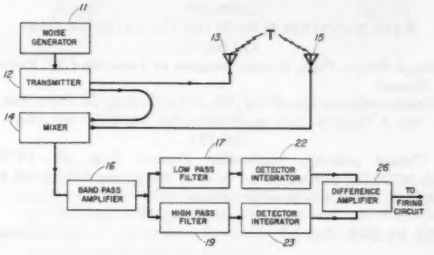
a metallic base extending along said route;

elongate antenna means including two parallel and coextensive lines subject to leakage losses, said lines being supported alongside each other on said base, one of said lines having one end terminated in a first load matching its characteristic impedance and having its opposite end connected to said transmission means for radiating said outgoing signals, the other of said lines having one end terminated in a second load matching its characteristic impedance and having its opposite end connected to said reception means for picking up said reflected signals; and a metallic strip rising from said base between said lines for mutually decoupling same to prevent direct signal transmission therebetween.

3,906,493
AUTOCORRELATION TYPE SPECTRAL COMPARISON FUZE SYSTEM

Donald J. Adrian, Arlington, and Carlton H. Cash, Norco, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1959, Ser. No. 802,577
Int. Cl.² F42C 13/04; G01S 9/32
U.S. Cl. 343—7 PF **6 Claims**

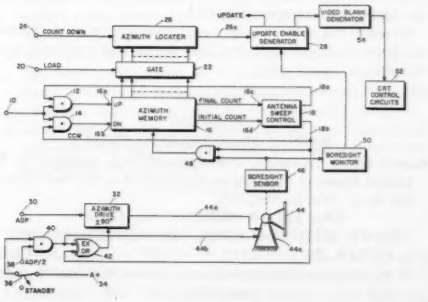


1. A fuze system comprising means for transmitting a frequency modulated carrier signal in the direction of a target, means coupled to said transmitting means for mixing a portion of said carrier signal with a return echo from said target and producing an output signal comprising a spectrum of coherent doppler wave portion plus an incoherent wave portion due to range noise, and means coupled to said mixing means for comparing the energy level of the coherent portion of said output signal with the incoherent portion of said output signal of said mixing means whereby a firing signal is obtained only when the energy level of said coherent signal exceeds the energy level of said incoherent signal by a predetermined amount.

3,906,494
MEANS FOR SYNCHRONIZING AN ANTENNA WITH A DIGITAL DATA DISPLAY

Robert A. Taylor, and Ruy L. Brandao, both of Ft. Lauderdale, Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 18, 1973, Ser. No. 425,768
Int. Cl.² G01S 7/40, 9/02
U.S. Cl. 343—5 DP **5 Claims**



1. A radar digital display system having a memory for storing digitized radar return signals and wherein a plurality of coherent control signals are generated and including utilization means responsive to said coherent control signals for

displaying data from said memory and additionally including means responsive to said coherent control signals for updating said memory in response to received radar returns, an improvement comprising:

means for sequentially generating a plurality of range lines whereon data related to data stored in said memory is sequentially displayed; and,

means responsive to the updating of said memory for blanking a predetermined one of said range lines.

3,906,495
RADAR SYSTEM FOR DETECTING LOW-FLYING OBJECTS

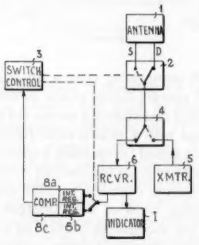
Joseph Roger, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 173,818, Aug. 23, 1971, Pat. No. 3,778,824. This application Jan. 24, 1973, Ser. No. 326,551

Claims priority, application France, Aug. 21, 1970, 70.30702The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.[2] G01S *9/22*

U.S. Cl. 343—7 A **7 Claims**



1. A method of detecting low-altitude objects with the aid of a radar transceiver provided with antenna means for sending out microwave energy during a transmitting interval and intercepting returning echoes thereof from a reflecting target during a receiving interval, comprising the steps of:

splitting the microwave energy during at least one of said intervals into two separately traveling components by the use of two vertically spaced radiators forming part of said antenna means;

providing two branch paths for the passage of microwave energy between said transceiver and said antenna means, said branch paths merging into a sum channel and a difference channel for additively and subtractively combining said components; and

selecting the more strongly energized one of said channels for the energization of a load during said receiving interval.

3,906,496
SIGNAL PROCESSOR SYSTEM

Hunter Crary Goodrich, Collingswood, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 10, 1974, Ser. No. 432,270

Int. Cl.[2] G01S *7/06, 9/36;* **G06F** *15/34;* **G11C** *11/42*

U.S. Cl. 343—9 **6 Claims**

1. An improved signal processor system usable with a doppler shift radar system comprising:

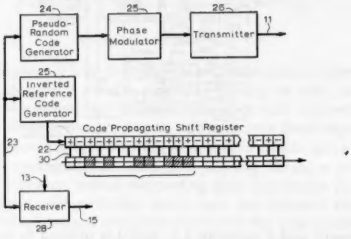
a. a radar system capable of generating a signal and receiving back signals from stationary and moving targets, said radar system having a pseudo random code generator to modulate the transmitted signal and inverted reference code generator, and a receiver;

b. a cathode ray tube;

c. electrical circuitry for generating a rectangular raster on the face of said tube, said receiver coupled by intensity modulate the raster on said cathode ray tube, the phosphorus in said cathode ray having a small but finite persistance;

d. a photo sensitive array consisting of a plurality of photo sensitive elements arranged in a two dimensional array capable of receiving light and generating electrical signals;

e. an optical system for projecting the raster of said cathode ray tube face on said photosensitive array;



f. an echo signal appearing on the raster of the cathode ray tube as coded signal, said echo signal on said face being projected on said photosensitive array;

g. said code generator coupled to said cathode ray tube to sweep the raster and intensity modulate the raster, said raster projected on said photosensitive array elements and causing the generation of electrical signals;

h. a series of summing circuits coupled to said photosensitive elements to add the electrical signals generated by target echoes and the random signals identify the said return signals, placement on said raster giving indication of distance to the target.

3,906,497
AIRBORNE ALTITUDE INDICATOR DEVICE

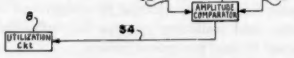
Jean Brasier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 29, 1973, Ser. No. 410,320

Claims priority, application France, Oct. 31, 1972, 72.38595

Int. Cl. G01s *9/04*

U.S. Cl. 343—12 A **10 Claims**



1. An airborne altimeter system for indicating the attainment of a predetermined operating altitude by a descending craft carrying same, comprising:

transceiver means for emitting a continuous sine wave of high-frequency electromagnetic radiation toward the ground, receiving reflected ground echoes of said sine wave and isolating therefrom a low-frequency Doppler component of an amplitude varying inversely with ground distance;

peak-detection means connected to said transceiver means for deriving from said Doppler component an aperiodic envelope signal proportional to the amplitude thereof;

a pair of passive impedance networks with mutually different transfer functions connected to said peak-detection means for energization by said envelope signal, said networks generating respective output signals of progressively varying magnitude ratio upon continuing descent of the craft;

comparison means with two inputs respectively connected to said networks; and

utilization means connected to said comparison means for actuation upon said ratio reaching a predetermined value.

3,906,498

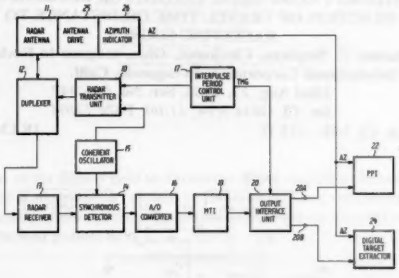
RADAR INTERFACE METHOD AND SYSTEM

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1973, Ser. No. 363,776

Int. Cl.[2] G01S *7/30*

U.S. Cl. 343—17.1 PF **25 Claims**



1. A method for providing target information signals at a fixed data interval in a pulsed radar system which radiates with variable interpulse periods comprising the steps of:

transmitting pulses of wave energy with an interpulse spacing which varies on a pulse-to-pulse basis about a predetermined average interpulse period;

deriving target information signals from consecutive return pulses of the wave energy at the variable interpulse period of the radar;

combining a plural number of consecutive target information signals derived from the reflected pulses of wave energy; and,

utilizing the combined target information signals at a fixed data interval equal to the average interpulse period of the radar multiplied by an integer number.

3,906,499

SCANNER PROJECTOR SYSTEM

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,267

Int. Cl.[2] G01S *7/40, 9/00*

U.S. Cl. 343—17.7 **11 Claims**

1. A scanner projector system for simulating to a radar system background conditions of a test scenario comprising in combination:

a. means for generating a laser beam;

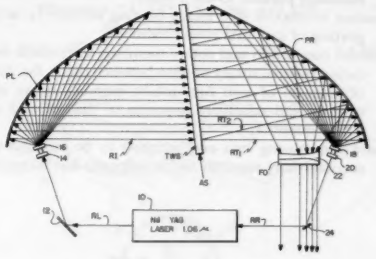
b. travelling wave scanner means;

c. means for directing said laser beam through said travelling wave scanner means;

d. means for transmitting a radar signal through said travelling wave scanner in a direction transverse to said laser beam, said radar signal selectively deflecting a portion of said laser beam;

e. means for directing said deflected portion of said laser beam along a predetermined path; and

f. scenario film means disposed in said predetermined path, said scenario film comprising a recorded variable density representation of the background conditions of said test scenario;



whereby said travelling wave scanner simulates the manner in which an actual radar signal scans said test scenario and said scenario film simulates the reflectivity of the background in said test scenario.

3,906,500

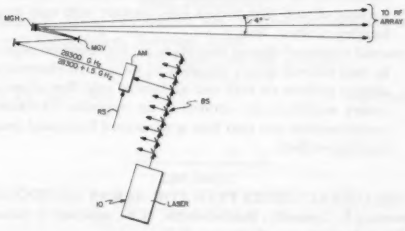
RADAR TARGET DIRECTION SIMULATOR

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,778

Int. Cl.[2] G01S *7/40, 9/00*

U.S. Cl. 343—17.7 **10 Claims**



1. A radar target direction simulator comprising in combination:

a. means for generating a laser beam of a selected frequency and wavelength as a reference signal;

b. means for modulating a portion of said reference signal, with a radar signal, said radar signal including information simulating said target;

c. detector array means including a plurality of juxtaposed like detector elements for simulating target angular and space position and for converting said modulated and reference signals to a radar frequency signal; and

d. means for directing said modulated reference signal and said reference signal toward a selected number of juxtaposed detector elements.

3,906,501

APPARATUS FOR COPYING AN ELECTROSTATIC CHARGE PATTERN IN INTENSIFIED FORM

Helmut Gustav Kiess, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,359

Int. Cl. G03g *15/18*

U.S. Cl. 346—74 ES **6 Claims**

1. Apparatus for reproducing, on an electrically insulating film, an electrostatic charge pattern in an intensified form

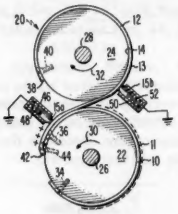
conforming substantially in configuration to an original electrostatic charge pattern on an electrically insulating image-bearing surface, said apparatus comprising:

first and second rotary members having axes disposed substantially parallel to each other,

means to dispose said image-bearing surface on at least a portion of said first rotary member,

means coupled to said rotary members to produce reciprocating relative rotary motion between them, the direction of rotation of said first rotary member being simultaneously and relatively opposite to that of said second rotary member,

said film having one end adapted to be secured to said second rotary member and an opposite end adapted to be



secured to said first rotary member so that when relative rotary motion is produced between said rotary members in one direction of reciprocation one surface of said film moves into contact with said image-bearing surface,

first source of charge migration means disposed adjacent to said first rotary member to induce an electrostatic charge pattern on the opposite surface of said film when said one surface of said film moves into contact with said image-bearing surface, and

second source of charge migration means disposed adjacent to said second rotary member to induce an electrostatic charge pattern on said one surface of said film when said rotary members are rotated in an opposite direction of reciprocation and said film is separated from said image-bearing surface.

3,906,502

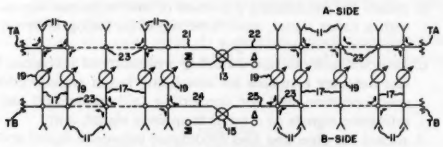
BILATERAL SERIES FEED FOR ARRAY ANTENNAS

Terrence E. Connolly, Baldwinsville, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,285

Int. Cl.[2] G01S *3/74*

U.S. Cl. 343—100 SA **7 Claims**



1. In combination in a phased array radiator system providing bidirectional first and second wave energy beams,

a. a plurality of radiation elements arranged in paired relation with the first elements of said pairs together constituting a first ordered array for forming said first beam and with the second elements of said pairs constituting a second ordered array for forming said second beam,

b. a plurality of branch feed lines one being connected between the two elements of each of said radiation element pairs,

c. a plurality of phase shift means one being interposed in each of said branch feed lines to control independently the phase of wave energy passed therethrough,

d. first and second transmission lines,

e. a plurality of directional coupling means spaced along each of said transmission lines, with the coupling means associated with said first transmission line intercoupling that line with each of said branch feed lines at points therein between said phase shift means and said second radiation elements, and with the coupling means associated with said second transmission line intercoupling that line and each of said branch feed lines at points therein between said phase shift means and said first radiation elements, and

f. transmit-receive means and means for coupling said transmission lines thereto for providing thereto or therefrom signals representative of the two wave energy beams respectively formed by said first and said second ordered arrays.

3,906,503

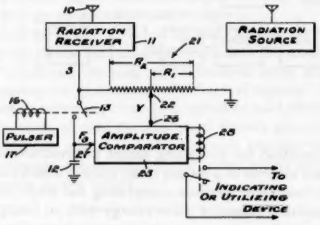
INTENSITY COMPARING SYSTEM FOR DETERMINING FRACTION OF TRAVEL TIME OR DISTANCE TO A RADIATING SOURCE

Thomas C. Stephens, Cincinnati, Ohio, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 27, 1956, Ser. No. 606,947

Int. Cl. G01s *5/14, 11/00;* **F42c** *13/04*

U.S. Cl. 343—112 D **18 Claims**



10. Means for indicating a positional situation for a radiation receiving means and a substantially constant average-energy radiation source moving together at a substantially-constant velocity comprising a voltage divider connected between ground and the output of said receiving means providing a proportional amplitude output, a capacitor having one end connected to ground, a switch connected serially between the other end of said capacitor and the output of said receiving means, pulser means for periodically opening and closing said switch with a closedduty cycle that is relatively small, amplitude comparator means having a pair of inputs connected to the proportional amplitude output and the capacitor, respectively, for providing an output at a predetermined amplitude relationship between its inputs, servo means connected to the output of said comparator means, and the output of said servo means connected to the tap point of said voltage divider to adjust it.

3,906,504

TUNNEL SEARCHER LOCATION AND COMMUNICATION EQUIPMENT

Allan Guster, Kensington Park, and Jeffrey E. Patterson, Seacliff Park, both of Australia, assignors to The Commonwealth of Australia, the Secretary Department of Supply, Canberra, Australia

Filed Oct. 8, 1969, Ser. No. 866,794

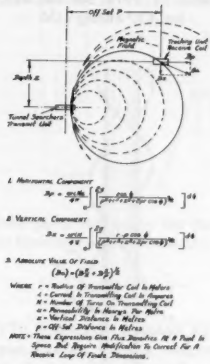
Claims priority, application Australia, Oct. 8, 1968, 44390/68

Int. Cl.[2] G01S *5/04*

U.S. Cl. 343—112 R **9 Claims**

1. A method of locating and plotting tunnels which consists of moving a portable electromagnetic induction field receiving

unit, containing a coil which can be orientated, over an area to be searched, locating a transmitting unit in the tunnel to give pulsed eliptical field lines, determing the location of the transmitter by measuring the horizontal and vertical compo-


Off Set P
Magnetic Field
Tracking Unit Receiver Coil
Depth d
Tunnel Specimen Transmit Unit
1. Horizontal Component
2. Vertical Component
3. Absolute Value Of Field
Where r = Radius Of Transmitter Coil In Meters
I = Current In Transmitting Coil In Amperes
N = Number Of Turns On Transmitting Coil
u = Permeability In Henrys Per Metre
d = Vertical Distance In Meters
p = Off Set Distance In Meters
NOTE = These Expressions Give Flux Densities. If A Probe Is Space Rod Require Modification To Correct For A Receive Loop Of Finite Dimensions.

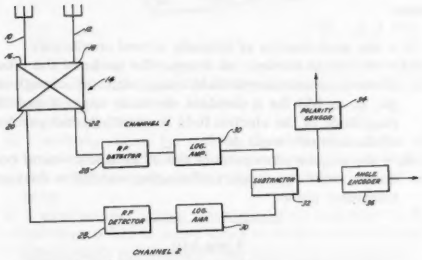
nents of the pulsed field to derive the depth and offset distance of the transmitter in relation to the receiver, and determining direction of the receiver by further orientation of the said coil in the said pulsed field.

3,906,505

METHOD AND APPARATUS FOR DETERMINING THE DIRECTION OF ARRIVAL OF A SIGNAL

Stephen E. Lipsky, East Hills, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Oct. 9, 1973, Ser. No. 404,312
Int. Cl. G01s *5/04*
U.S. Cl. 343—119 **12 Claims**



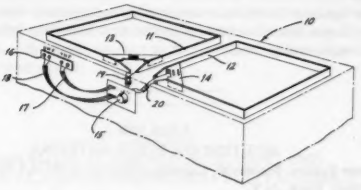
1. Apparatus for determining the direction of arrival of a signal comprising a pair of omnidirectional antenna elements, means for phase combining the output signals from said elements such that said elements are effective to form a pair of simultaneous cardioid reception patterns, means for generating separate data signals representative of the magnitude of the signal received by each of the cardioid patterns respectively and means for detection and signal normalization, said detection and signal normalization means being frequency independent throughout the instantaneous radio frequency band over which the cardioid pattern is capable of being formed, thus providing a resultant signal indicative only of the direction of arrival of said received signal.

3,906,506

BUILT-IN TELEVISION CONSOLE ANTENNA

Jugal K. Verma, Conshohocken, and Buran I. Keprta, Jr., Norristown, both of Pa., assignors to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Mar. 25, 1974, Ser. No. 454,175
Int. Cl.² H01Q *1/24*
U.S. Cl. 343—702 **8 Claims**



1. A built-in antenna for receiving signals in a television receiver having separate VHF and UHF tuners, said antenna comprising:

A pair of single turn loops adapted for mounting horizontally in spaced apart side by side relationship and in a common plane inside the cabinet of said receiver, and

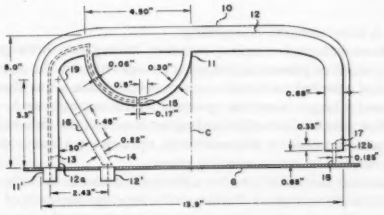
means including a switch for connecting said loops to said receiver in combinations including either of said loops singly to either of said tuners and both of said loops connected together to either of said tuners, said switch being positionable for best signal reception.

3,906,507

COMBINATION GLIDESLOPE/LOCALIZER ANTENNA FOR AIRCRAFT

William P. Allen, Jr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Mar. 27, 1974, Ser. No. 455,262
Int. Cl.² H01Q *1/28*
U.S. Cl. 343—705 **6 Claims**



1. A combination glideslope/localizer antenna for aircraft comprising:

a first and a second half-loop of electrically conductive material disposed in a common plane, said first half-loop having opposite ends connected to ground with end portions substantially perpendicular to said ground and generally symmetrical about a centerline drawn perpendicular to said ground, and said second half-loop being substantially hemicircular with opposite ends joining the edge of said first half-loop on the side thereof proximate said ground to thereby be substantially enclosed by said first half-loop;

a shunt feed line operatively connected to said first half-loop, said shunt feed line including means for impedance matching of said first half-loop;

a connector individual to a receiver for each glideslope and localizer antenna, the localizer receiver connector being electrically coupled to said shunt feed line;

a break in the electrical continuity of each said half-loop, the break in said first half-loop being located on the remote end thereof with reference to said shunt feed line;

a capacitor in the length of each said half-loop at said break;

a first conductor operatively connected between the capacitor associted with the second half-loop break aforesaid and its connector;

and

a second conductor operatively connected between the capacitor associated with the first half-loop break aforesaid and ground.

3,906,508

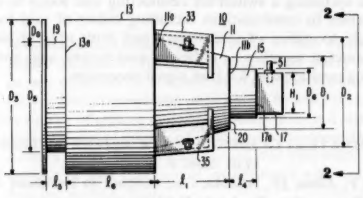
MULTIMODE HORN ANTENNA

Peter Foldes, Montreal, Canada, assignor to RCA Corporation, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,770

Int. Cl.² H01Q *13/00*

U.S. Cl. 343—786 **10 Claims**



1. A horn antenna comprising:

a funnel-shaped coupling member having two orthogonal symmetry planes and having an aperture at the narrow end adapted to excite a symmetrical mode wave therein and a larger diameter aperture at the opposite end,

a first pair of side wall coupling apertures in the side wall of said member at diametrically opposite surfaces of the member in one symmetry plane,

a second pair of side wall coupling apertures in the side wall of said member at diametrically opposite surfaces of said member in the second of said orthogonal symmetry planes, said first and second pair of side wall coupling apertures being adapted to excite two orthogonal asymmetrical modes,

a waveguide section of a diameter large enough to support said symmetrical mode and small enough to reflect said asymmetrical modes and smaller than the diameter of the aperture at the narrow end of said member coupled by a first step to said narrow end of said member,

a cylindrical waveguide of a diameter larger than said larger diameter aperture of said member coupled by a second step to said opposite end of said member, said cylindrical waveguide section having a ring-like member dividing said cylindrical waveguide into two sections, said first and second steps and said ring-like member being dimensioned and arranged so that the two main lobes in the radiation patterns associated with the two asymmetrical modes have substantially the same beamwidth pattern of the single main lobe radiation pattern associated with the symmetrical mode.

3,906,509

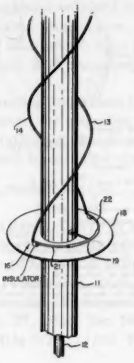
CIRCULARLY POLARIZED HELIX AND SPIRAL ANTENNAS

Raymond H. DuHamel, 12001 Rhus Ridge Rd., Los Altos Hills, Calif. 94022

Filed Mar. 11, 1974, Ser. No. 449,946

Int. Cl.² H01Q *1/36*

U.S. Cl. 343—895 **15 Claims**



1. An elliptically polarized helical antenna with low axial ratio comprising a support having a conductive outer surface, at least two conductors spaced from said surface and helically wound about said surface in the same direction, said conductors wound with a pitch angle greater than 25°, means for supporting the helical conductors spaced from said surface, and means for feeding the adjacent end of each of said two or more conductors with voltages of substantially equal magnitude and having predetermined phase relationship whereby to excite said antenna in a selected mode, said helically wound conductors being unequally spaced around the support and the feed voltages are given by

$$V_n = e^{j\phi_n M}$$

where

$n = 1, 2, \ldots N$

N = the total number of helically wound conductors

M = the mode number, an integer, for mode M the phase of the radiated electric field varies with the azimuth angle, ϕ, as $M\phi$ for a constant elevation angle θ, and the magnitude of the electric field is essentially independent of the azimuth angle ϕ,

ϕ_n = the angular placement of the n^{th} helically wound conductor about the support, all starting and fed at the same transverse plane.

3,906,510

RECORDING METHOD BY PHOTOSENSITIVE MATERIALS

Shuzo Hattori, Nagoya; Mikio Eto, Tokyo; Kenji Morino, Chiba, and Tuyoshi Fujita, Hachiohji, all of Japan, assignors to Oriental Photo Industrial Co., Ltd. and Kimmon Electric Co., Ltd., both of Tokyo, Japan

Filed June 20, 1974, Ser. No. 481,274

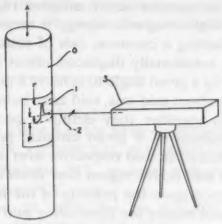
Claims priority, application Japan, June 23, 1973, 48-71177; June 23, 1973, 48-71178

Int. Cl.² G01D *9/20*

U.S. Cl. 346—1 **8 Claims**

1. A method for recording movements of objects or datum lines which comprises employing a photodevelopable photosensitive material, a dye filter having strong absorption in the ranges of wavelengths excluding the vicinity of the wavelength of the laser ray employed for the first exposure of light and a

laser, fixing said photosensitive material protected from outdoor light by said filter to the object to be measured, and



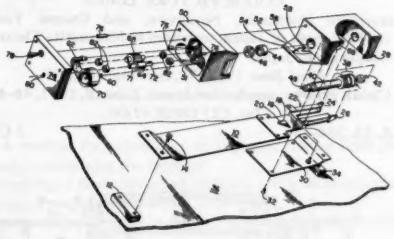
printing the datum point formed by the flux of the laser ray emitted from the laser on said photosensitive material through the filter.

3,906,511

CASSETTE SCRATCH STRAIN RECORDER

Jozsef W. Kelemen, Ottawa, Canada, assignor to Leigh Instruments Limited, Carleton Place, Canada

Filed Nov. 19, 1973, Ser. No. 416,958
Int. Cl.[2] G01B 5/30; G01D 9/38
U.S. Cl. 346—7 10 Claims



1. A recording instrument for measuring and recording changes in linear distance between two predetermined points comprising:

a. a recording tape;

b. a scribing means for making the changes in linear distance on said tape, said scribing means moving in a direction which is transverse to the longitudinal axis of said tape;

c. a tape housing means accommodating said tape so that said tape is free to move along its longitudinal axis but is substantially constrained from transverse movement;

d. a tape drive means for longitudinally advancing said tape under the influence of both positive and negative changes in said linear distance, said tape drive means including a linear motion amplifier and a reciprocating to rotary motion converter, said reciprocating to rotary motion converter being comprised of a double spring clutch, said clutch comprising a disc having an outer cylindrical surface and a first and a second single turn spring, said first and second spring each having an internal diameter, the outside diameter of said disc being greater than said internal diameter of said first and second spring, said first and second spring each being mounted on said cylindrical surface of said disc, each spring having one of its ends connected to said linear motion amplifier whereby when said ends are moved in one substantially linear direction by said linear motion amplifier said first spring tightens on said disc whereby turning said disc in one direction of rotation, said second spring loosening on said disc, thereby allowing said rotation, and whereby, when said ends are moved in the opposite substantially linear direction by said linear motion amplifier, said second spring tightens on said disc thereby turning said disc in said one direction of rotation, said first spring loosening on said disc thereby allowing said rotation; and

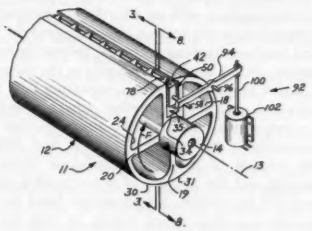
e. a recordoer housing enclosing said tape drive means, said recorder housing being fixed to one of said two predetermined points and said scribing means being in a fixed relationship with respect to the other of said two predetermined points.

3,906,512

MECHANICAL DRUM POSITIONING AND SHEET-CLAMPING MECHANISM FOR FACSIMILE

Jan M. Farlow, Fort Wayne, Ind., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 319,343, Dec. 29, 1972, abandoned.
This application Apr. 29, 1974, Ser. No. 465,284
Int. Cl.[2] G01D 15/28; H04N 1/08
U.S. Cl. 346—138 4 Claims



1. In a facsimile device comprising a rotatable drum having an axis of rotation and an outer surface that defines a cylinder, improved apparatus for clamping at least one edge portion of a sheet of matrial to the drum so that the sheet is wrapped around the outer surface as the drum is rotated comprising in combination:

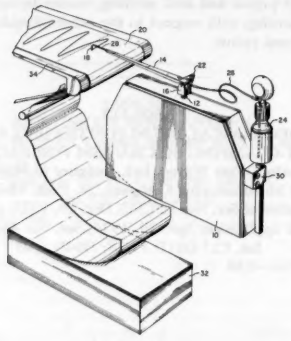
means on the drum inside the cylinder for forming an undercut clamping surface accessible from outside the drum and extending substantially parallel to the axis of rotation; a transducer positioned adjacent the outer surface of the drum for producing an image on the sheet; and

a clamp member movable between a clamped position in which the clamp member clamps the sheet to the clamping surface and an unclamped position in which the clamp member is spaced from the clamping surface to release the sheet, said clamp member being mounted within the drum so that all portions of the clamp member remain within the cylinder in at least the clamped position, said clamp member comprising a mounting member movably mounted within said drum, and a plurality of gripping fingers, each of said gripping fingers having a first end portion connected to the mounting member and a second unsupported end portion adapted to engage the sheet in the clamped position such that a force tending to withdraw the sheet from the clamped position urges the second end portion of each gripping finger toward the clamping surface, whereby the force exerted by the gripping fingers on the sheet is increased.

3,906,513
LOW-PRESSURE INKING SYSTEM

Abe Siegelman, Morton Grove; Robert N. Quoss, Clarendon Hills, and Raymond M. Pawlak, Addison, all of Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 50,652, June 29, 1970, abandoned. This application June 16, 1972, Ser. No. 263,699
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 **2 Claims**

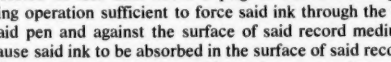


1. A low-pressure hydrostatic writing system which comprises a record medium with an effectively absorbent surface, a pen having a tubular tip section biased against the surface of said record medium forming a closure therewith during writing operations, an ink having a viscosity in the range of about 1–30 cps within said pen, said ink comprising 20% to 35% by weight ethylene glycol monomethyl ether, a water-soluble coloring agent and a water-soluble resin selected from the group consisting of polyvinylpyrrolidone and polyethylene oxide, the amount of polyvinylpyrrolidone being 0.1% to 5% by weight and the amount of polyethylene oxide being 0.01% to 0.3% by weight, a hydrostatic head for applying a pressure of less than about 2 psig. to said ink during a writing operation sufficient to force said ink through the tip of said pen and against the surface of said record medium to cause said ink to be absorbed in the surface of said record medium, and means biasing said tubular pen against said record medium with a force of about 1–3 grams.

3,906,514
DUAL POLARIZATION SPIRAL ANTENNA

Harry Richard Phelan, Indialantic, Fla., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 192,869, Oct. 27, 1971, abandoned. This application May 23, 1973, Ser. No. 363,029
Int. Cl.[2] H01Q *19/06*
U.S. Cl. 343—895 **10 Claims**

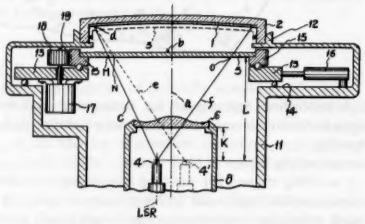


1. An element antenna for receiving and reradiating circular polarized electromagnetic energy comprising a plurality of elongated electrically conductive spiral arms spaced from each other, each said arm having inner and outer ends and at least an intermediate portion of its length between said ends located in an annular active antenna region where circular polarized electromagnetic energy is received and reradiated, said arms having a common axis of rotation, said inner arm ends being rotationally displaced about said axis relative to each other by a given angle to achieve a given rotational phase progression about said axis, said arms being configured so that when taken together they define a geometric polarization element antenna of a given circular polarity whereby the currents induced in said respective arm portions from energy received in said active region flow towards specific arm ends in dependence upon the polarity of the received energy, and phase control means for controlling said element antenna to reradiate circular polarized energy of the same polarity as the received energy and for controlling the phase relationship of the reradiated energy with respect to the received energy and including interconnecting means for effectively interconnecting selected ones of said arm ends of the same sense, for controlling the phase relationship of said currents re-entering said active region from said arm ends of both senses to effect reradiation from said active region in such a manner that the energy reradiated in the general direction of the received energy is of the same circular polarity as the received energy independently of the said geometric polarization of said element antenna and such that the phase relationship of said reradiated energy relative to said received energy is determined by said selected interconnection.

3,906,515
APPARATUS AND METHOD OF MANUFACTURING COLOR PICTURE TUBES

Kakuichiro Hosokoshi, Neyagawa, and Osamu Yoshida, Otokuni, both of Japan, assignors to Matsushita Electronics Corporation, Japan

Filed June 19, 1972, Ser. No. 264,356
Claims priority, application Japan, June 18, 1971, 46-44414
Int. Cl.[2] G03B *41/00*
U.S. Cl. 354—1 **2 Claims**



1. In an apparatus for manufacturing a color screen on the face panel of a color picture tube including a support means for supporting a face panel and a shadow mask, the improvement comprising:

a point-light source for emitting light,

a refracting lens located between the light source and said support means for refracting paths of light beams directed from said point-light source to a photosensitive film on the inner surface of a face panel through apertures of a shadow mask, the light source being located on an off-center position of the axis of a face panel supported by said support means, and

light-attenuator means in the form of a semi-transparent mask for controlling the exposure distribution on a photosensitive film on the inner surface of a face panel and located between the lens and the support means in closer proximity to the support means,

wherein said light-attenuator means has a central axis, and further including means for continuously rotating said

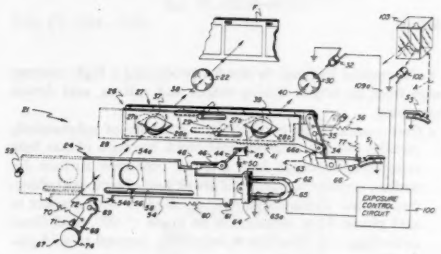
attenuator means around its central axis during an exposure of light from said point-light source to a photosensitive film, and wherein the distance between the point-light source and the light-attenuator means is more than 1.5 times the distance between the point-light source and the refracting lens.

3,906,516

METHOD AND APPARATUS FOR CONTROLLING EXPOSURE IN ARTIFICIAL ILLUMINATION

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,490
Int. Cl.[2] G03B 7/08, 15/03
U.S. Cl. 354—27 17 Claims



6. A method for controlling an exposure during flash photography comprising the steps of:

a. energizing a flash device to produce artificial illumination having a particular duration;

b. illuminating a scene to be photographed with such illumination;

c. automatically adjusting, during an initial portion of such artificial illumination, an aperture through which light reflected from such a scene is to be projected to produce the smallest aperture with which a particular exposure value can be produced during a final portion of said artificial illumination; and

d. exposing photographic film to reflected scene light once said smallest aperture is selected to produce said exposure value.

10. In a camera of the type adapted for receiving a photographic flash device and having means actuatable for energizing such a flash device, the improvement comprising:

a. means for producing a time varying progression of effective exposure apertures through which light reflected from a scene to be photographed is to be projected onto photographic film;

b. means actuatable for initiating movement of said exposure aperture producing means in timed relation to energization of a received flash device;

c. light-sensitive control means operatively associated with said aperture producing means for establishing, during an initial portion of the flash illumination, an effective exposure aperture having a magnitude adequate to produce a given film exposure value during a final portion of such artificial illumination; and

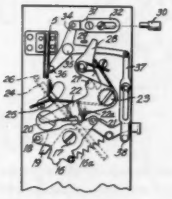
d. shutter means responsive to said aperture establishing means for exposing the film to reflected scene light to produce said given exposure value.

3,906,517

MANUAL STOP-DOWN DEVICE FOR CAMERAS HAVING AUTOMATIC EXPOSURE CONTROLS

Katsuhiko Nomura, Kawagoe; Fumio Urano, Omiya, and Hiroshi Kurei, Kawagoe, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Feb. 22, 1974, Ser. No. 444,880
Claims priority, application Japan, Feb. 24, 1973, 48-23867
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—51 5 Claims



1. In a camera, having a shutter and a diaphragm stop-down means for stopping said diaphragm down from a fully open light-measuring position to a preselected exposure aperture, circuit means for automatically determining exposure time, said circuit means including a light-measuring means for measuring light received through a fully open diaphragm, a memory capacitor means for storing an electrical quantity corresponding to the light measured by said light-measuring means, and normally closed switch means connected between said light-measuring means and memory capacitor means for transmitting to the latter the electrical quantity to be stored in accordance with the light measured by said light-measuring means, shutter-tripping means operatively connected with said shutter to trip the latter to make an exposure, said shutter-tripping means being operatively connected with said normally closed switch means and with said diaphragm stop-down means for first opening said normally closed switch means and then operating said diaphragm stop-down means prior to tripping of the shutter, and manually operable means operatively connected with said diaphragm stop-down means for manually operating the latter independently of said shutter-tripping means to stop the diaphragm down to the preselected aperture for viewing the depth of field prior to an exposure, said manually operable means being operatively connected with said switch means for opening the latter prior to operating said diaphragm stop-down means for stopping down of the diaphragm so that the electrical quantity stored by said memory capacitor means will not be influenced by the manual stopping down of the diaphragm for the purpose of preliminarily viewing the depth of field.

3,906,518

MECHANICAL EXPOSURE TIME CONTROL MECHANISM FOR USE IN A FOCAL PLANE SHUTTER FOR PHOTOGRAPHIC CAMERA

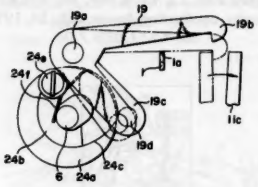
Toshio Kobori, and Toru Sumita, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Oct. 24, 1973, Ser. No. 409,154
Claims priority, application Japan, Oct. 30, 1972, 47-109043
Int. Cl.[2] G03B 9/64
U.S. Cl. 354—51 8 Claims

4. A mechanical exposure time control mechanism for a focal plane shutter as set forth in claim 3 comprising a multiple position switch means operably connected to said selecting member;

said multiple position switch assuming a first position when said selecting member has selected mechanical exposure time control, and a second plurality of positions when said selecting member has selected electrical exposure time control;

a photoelectric element connectable to said timing circuit when said multiple position switch is in one of the plurality of second positions; and



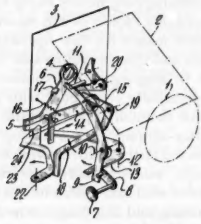
a plurality of resistors selectively connectable to said timing circuit when said multiple position switch is in one of said plurality of second positions other than said one position.

3,906,519

SINGLE LENS REFLEX CAMERA LIGHT MEASURING SYSTEM

Hiroshi Ueda, Nara, and Akira Yoshizaki, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 16, 1973, Ser. No. 379,685
Claims priority, application Japan, July 31, 1972, 47-90660
Int. Cl.² G03B *7/00, 19/12*
U.S. Cl. 354—59 **5 Claims**



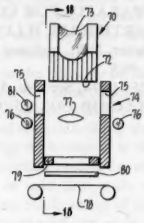
1. In a single lens reflex camera including a shutter, a shutter release, an objective lens, a mirror having a semi-transparent section and moveable from an advanced position in the light path between said objective lens and said shutter to a retracted position out of said light path with the initiation of operation of said shutter release, a photo-sensitive element located in said light path behind said mirror in said advanced position thereof for receiving light from said objective lens through said semi-transparent section of the mirror and moveable with said initiation of shutter release operation out of said light path, and means for manually retracting said mirror from said light path independently of said shutter release operation, a light measuring system comprising said photo-sensitive element and means for varying the response of said light measuring system in response to the manual operation of said manually retracting mirror means to compensate for the increased amount of light directed toward said photo-sensitive element attendant to the manual retraction of said mirror out of said light path, whereby said light measuring system provides a similar measurement of the light from said objective lens with said mirror in said retracted position and in said advanced position.

3,906,520

APPARATUS FOR PRODUCING A HIGH CONTRAST VISIBLE IMAGE FROM AN OBJECT

Brian G. Phillips, Cupertino, Calif., assignor to Optics Technology, Inc., Redwood City, Calif.

Filed Aug. 3, 1973, Ser. No. 385,627
Int. Cl.² G03B *29/00;* **G02B** *5/16*
U.S. Cl. 354—62 **21 Claims**



1. An optical imaging device for producing a high contrast image from an object having ridges and valleys, said device comprising:

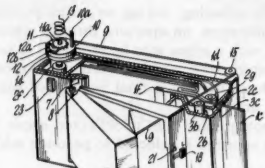
a fibre optics block comprising a plurality of substantially parallel individual fibres, said block having a planar light input/image output face and an objective surface for surface contact with said ridges of said object, said objective surface being inclined at an angle θ with respect to said planar face, where θ is an angle $< 90°$, said fibres extending in a direction substantially normal to said planar face.

3,906,521

SELF-PROCESSING CAMERA

Hiroshi Ueda, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 26, 1974, Ser. No. 492,117
Claims priority, application Japan, July 28, 1973, 48-84597
Int. Cl.² G03B *17/50*
U.S. Cl. 354—86 **10 Claims**



1. A self-processing camera, comprising:

a magazine replaceably mountable to the camera and housing therein at an exposure position a film unit including a composite image receiving sheet and photosensitive sheet and a processing agent containing means separated from said sheets and rupturable to supply the processing agent thereto;

a main camera body provided with means for transporting said film unit and a member for applying pressure to the processing agent containing means in said transported film unit, thereby rupturing said processing-agent containing means and distributing the processing agent between said both sheets;

a lens frame body movable between a retracted position and an extended position relative to said camera body and having a shutter and a photographing lens which are directed toward said film unit when said frame body is in its extended exposure position;

a collapsible bellows extending between said lens frame body and said camera body in light-tight fashion; and

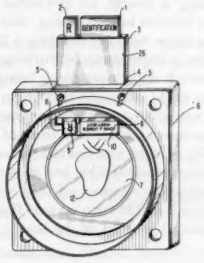
means responsive to the movement of said lens frame body between its extended and retracted positions for actuating said transport means to effect the advance of and processing of said film unit.

3,906,522

NON-CONTACT PHOTOGRAPHIC IDENTIFICATION DEVICE FOR LABELING GAMMA CAMERA IMAGES

Robert G. Carroll, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Feb. 8, 1973, Ser. No. 330,647
Int. Cl. G03b *17/24*
U.S. Cl. 354—105 **6 Claims**



1. A light-tight non-contact photographic identification device for labeling gamma camera or other cathode ray tube images as displayed on the face of a cathode ray tube device upon being photographed on film by a conventional camera, comprising:

indicia means for identifying the image displayed on the face of the cathode ray tube, wherein said indicia means is contained within substantially the same focal plane as the gamma camera or other cathode ray tube image, said indicia means further including removably engageable slide means for view identifying and for identification, said view identifying and identification slide means being permanently marked with appropriate opaque position identifying letters and with a removable adhesive comprising opaque identifying legends and comprising the name of the patient or subject;

self-luminous means for producing the necessary light to imprint the film with the image of said indicia means simultaneously with the activation of said self-luminous means, wherein said self-luminous means is contained within substantially the same focal plane as the gamma camera or other cathode ray tube image; and

positioning means contained within substantially the same plane as the face of a cathode ray tube for positioning said indicia means and said self-luminous means adjacent the face of the cathode ray tube in substantially the same plane as the face of the cathode ray tube,

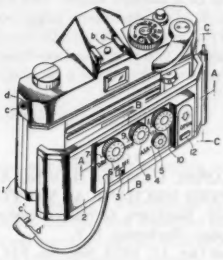
whereby the imprinting of the film with the image of said indicia means simultaneously with the activation of said self-luminous means eliminates mislabeling of the gamma camera or other cathode ray tube image, caused by double handling and successive exposure.

3,906,523

DEVICE FOR PHOTOGRAPHING RECORDING DATA ONTO THE FILM IN A PHOTOGRAPHIC CAMERA

Mitsutoshi Ogiso, Kawasaki, and Shohei Ohtaki, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1973, Ser. No. 401,974
Claims priority, application Japan, Oct. 3, 1972, 47-99221
Int. Cl. G03b *17/24*
U.S. Cl. 354—109 **8 Claims**



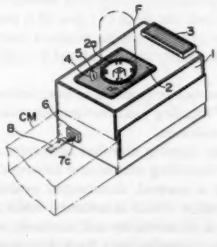
1. For a camera having a shutter and a selectively coupleable flash arrangement and a synchronizing switch that responds to the shutter for operating the flash arrangement, a system for entering data onto film in the camera in addition to the image of the object being photographed, comprising variable data carrying means for exhibiting variable data, an energizable light source for illuminating the data on the carrying means when the light source is energized, optical means for directing the illuminated data onto the film in the camera, a control circuit responsive to the synchronizing switch for energizing the light source in response to actuation of the switch so as to record data on the film, and electrical circuit means between the synchronizing switch and the control circuit for preventing large voltages in the flash arrangement from affecting the control circuit when the synchronizing switch actuates the control circuit and the flash arrangement simultaneously, said electrical circuit means including a component having a nonlinear electrical characteristic.

3,906,524

FLASHCUBE MOUNT

Shigeru Oshima, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 28, 1974, Ser. No. 484,189
Claims priority, application Japan, July 24, 1973, 48-83801
Int. Cl.[2] G03B *15/04*
U.S. Cl. 354—142 **9 Claims**



1. A flashcube mount on the outer surface of which is provided a socket engageable with a percussively fireable flashcube comprising: (a) an outer housing having means for attachment to a camera, (b) a firing pin movable to fire a flashcube attached to said housing, (c) a push-button, for actuating

said firing pin and operating a camera shutter synchronously, operatably provided on said mount, (d) a first lever pivotally attached to said housing and rotatable by said push-button, (e) a pivotal percussion plate pivotally attached to said housing which carries said firing pin, (f) a detent plate fixedly attached at one end to said percussion plate, (g) a spring plate, one end of which is fixedly attached to said percussion plate, and another end of which engages said push-button, (h) a second lever means pivotally attached to said housing which is rotatable by said first lever means upon depression of said push-button, said second lever actuating a camera shutter actuation means of a camera usable with said mount when mounted on such a camera upon being rotated a certain amount, and (i) a cam surface on said second lever means engaging said detent plate to prevent movement of said detent plate until said second lever means is rotated a predetermined amount.

3,906,525
PHOTOGRAPHIC CAMERA HAVING A VARIABLE SPEED MECHANICAL SHUTTER

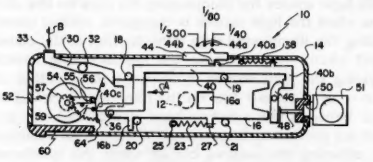
Helmut Ettischer, Stuttgart, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1974, Ser. No. 514,035

Claims priority, application Germany, Mar. 13, 1974, 2411920

Int. Cl.² G03B *15/03, 9/58, 9/36*

U.S. Cl. 354—149 **5 Claims**



1. A photographic camera having an exposure aperture and means adapted for releasably receiving a photographic flash device, said camera comprising:

a. shutter means movable for sequentially covering and uncovering the exposure aperture;

b. a shutter speed setting member settable over a range of positions each of which is indicative of a particular shutter speed;

c. movement retarding means for regulating shutter speed movable in association with said shutter means over an operational path between (1) one of a plurality of initial positions and (2) an extreme position, each of said initial positions being functionally related to a particular shutter speed;

d. a control member responsive to said shutter speed setting member for locating said movement retarding means in said initial positions;

e. a flash device sensing member communicating with said flash device receiving means and mounted for movement between (1) a normal, deactuated position and (2) an actuated position which is assumed when a photographic flash device is received by said camera; and

f. a control lever coupling said flash device sensing member to said control member for enabling said movement retarding means to be positioned in a particular one of said initial positions when said sensing member is in said actuated position which is independent of said shutter speed setting member.

3,906,526
FLASH AND CAMERA DEVICE

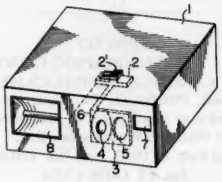
Sakae Toyoshima, Hirakata, and Yasunori Sawada, Osaka, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Oct. 23, 1973, Ser. No. 408,533

Claims priority, application Japan, Oct. 26, 1972, 47-123679

Int. Cl.² G03B *15/03, 15/05*

U.S. Cl. 354—149 **6 Claims**



1. Apparatus including a lens for use with photographic film, comprising: a casing; an electronic flash device and a camera device housed in said casing, said flash device including a flash discharge tube for emitting a flash; a power source switch including a finger piece for turning on and off said flash device, said switch and finger piece being slidably connected with respect to said casing and said finger piece being located outside said casing; an aperture change-over means having a plurality of apertures locatable in front of the lens for optimizing the quantity of light transmitted through one of said apertures and the lens onto the film; and means integrally connecting said change-over means and said switch, wherein when said finger piece is slid to turn on said flash device one of said apertures is placed in front of the lens.

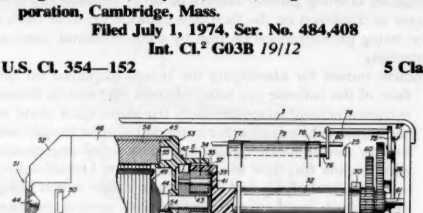
3,906,527
SHAFT DRIVE AND CONTROL SYSTEM FOR AUTOMATIC CAMERA

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 1, 1974, Ser. No. 484,408

Int. Cl.² G03B *19/12*

U.S. Cl. 354—152 **5 Claims**



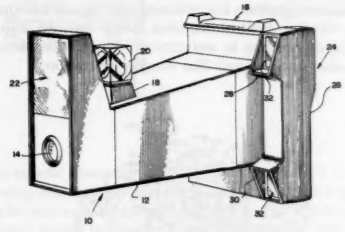
1. A drive train for a reflex camera having a pair of processing rolls, a mirror recocking cam and a film advance pick, comprising, in combination, an electric motor, a first drive shaft, strain wave drive shaft speed reduction means connected between said motor and said first shaft to drive said shaft at a speed suitable for operating said processing rolls, means comprising an elongated toothed endless belt coupling said first shaft to said processing rolls, a pick control element, means comprising a first reduction gear coupling said first shaft to said pick control element, a mirror recocking cam, and a second reduction gear coupling said first reduction gear to said cam.

3,906,528

PHOTOGRAPHIC COMPOSING AID ENCLOSED WITHIN A CAMERA HANDLE

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 29, 1970, Ser. No. 50,380
Int. Cl. G03b *3/00*
U.S. Cl. 354—162 1 Claim



1. A portable photographic camera comprising: means for forming a real image of a subject on a photosensitive material within an area of given size and shape;

a handle, fixed to said camera, having a grip thereon to grasp said handle by, for providing manual support to said camera;

first and second entrance windows, in said handle, separated by said grip, for allowing light to enter said handle;

a fixed beam splitter, inside said handle, behind said first entrance window, for receiving a first image of said subject through said first entrance window;

a fixed mirror, inside said handle, behind said second entrance window, for receiving a second image of said subject through said second entrance window and reflecting said second image along a base line through said handle past said grip towards said fixed beam splitter where said first and second images are combined by said fixed beam splitter, said first and second images reaching said first and second windows along first and second optical paths, respectively, that intersect at a predetermined fixed distance from said camera;

an exit window positioned behind said fixed beam splitter to transmit said combined images;

lens means, inside said handle and disposed along said baseline, for adjusting the size and apparent origin of said second image so said first and said second images of said subject appear, viewed through said exit window, to be the same size and diistance from said camera;

frame means, inside said handle, for forming an outline of bright lines around said combined images of said subject, said outline being illuminated by light entering said handle through said second entrance window and reaching said frame means via said mirror and its size being related to said area on said photosensitive material within which said real image is formed, said outline being viewable through said exit window, said frame means including a field lens, a reticle and a magnifying lens, said field lens directing the light rays forming said outline through said reticle, said reticle having transparent portions in the shape of said outline, towards said frame lens, said magnifying lens forming said outline as a virtual image of said reticle's transparent portions, said reticle, said field lens, and magnifying lens being coaxial with said baseline and surrounding said image size adjusting lens means; and

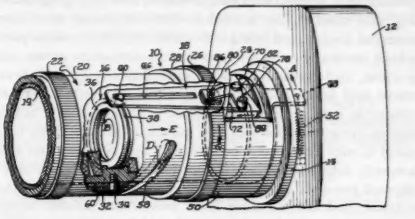
a main frame member, inside said handle, vigidly supporting said beam splitter, said mirror, said lens means, and said frame means.

3,906,529

ZOOM LENS MECHANISM

Danny Filipovich, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 10, 1973, Ser. No. 395,757
Int. Cl. G03b *9/02*
U.S. Cl. 354—196 13 Claims



1. A zoom lens and diaphragm mounting barrel mechanism comprising:

a fixed lens barrel having a longitudinal axis mountable on a photographic camera with a shutter mechanism;

a movable barrel coaxially aligned with said fixed barrel and mounted for rotation relative thereto;

a zoom lens group including at least one lens mounted coaxially within said lens barrel for axial movement relative thereto in response to rotation of said movable barrel;

an adjustable diaphragm structure disposed within the lens barrel in coaxial alignment with said zoom lens group and being capable of providing a plurality of aperture sizes, said diaphragm structure including an iris mounted on said zoom lens group for axial movement therewith, said iris having a constant aperture during said axial movement; and

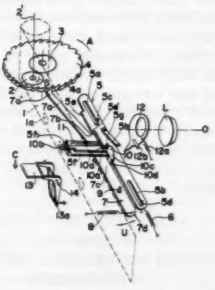
movable diaphragm operating means operably connecting said shutter mechanism for actuating said iris to form a desired aperture.

3,906,530

SIMPLIFIED CAMERA

Shigeru Oshima, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 15, 1974, Ser. No. 488,854
Claims priority, application Japan, July 24, 1973, 48-83802
Int. Cl.[2] G03B *17/42*
U.S. Cl. 354—206 1 Claim



1. In a simplified camera including a shutter and wherein loaded film is advanced by actuation of a wind-up gear, an improvement comprising: a small diameter gear engaging and driving said wind-up gear, a large diameter ratchet being in fixed and coaxial connection with said small diameter gear, and being manually rotatable, a shutter actuation means being reciprocally slidable along a line parallel to film advance, and which comprises a salient portion and an engagement projec-

tion protion, means exerting a constant force to move said shutter actuation means in a direction opposite to film advance, a film engagement lever, being pivotally and slidably mounted on said shutter actuation means to engage successive perforations in a loaded film, and to move said shutter actuation means in the same direction as film advance, means urging said film engagement lever towards said loaded film, a pivotal lock lever comprising a detent end engaging and locking said ratchet, an actuation end connected to a camera external means and being moveable thereby, a main portion, which normally contacts said shutter actuation means salient portion, and contactable with said film engagement lever to move said lever out of contact with said loaded film, and a pivotable lock portion, engageable with said shutter actuation means projection portion, and means urging said lock lever to pivot to move said main portion and said lock portion thereof towards said shutter actuation means, and said detent end thereof towards said ratchet, whereby, when said ratchet is rotated, said film advance lever moves said shutter actuation means to a cocked position, and said lock lever is moved to hold said shutter actuation means in said cocked position, to lock said ratchet, and to move said film engagement lever out of engagement with said film, and, when said camera external means is actuated, said lock lever is moved to disengage said shutter actuation means, and said shutter actuation means is moved to an uncocked position, and actuates a camera shutter.

3,906,531

SHUTTER SCREEN ASSEMBLY FOR A FOCAL PLANE SHUTTER

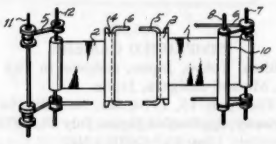
Haruo Ishii, Wako; Fumio Urano; Masahiro Kawasaki, both of Omiya, and Toshio Mochizuki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 451,826

Claims priority, application Japan, Mar. 26, 1973, 48-36546

Int. Cl.² G03B 9/34

U.S. Cl. 354—242 **1 Claim**



1. In a focal plane shutter for a camera, a shutter screen assembly comprising front and rear relatively movable shutter screens having ends folded back to form tubular passages shutter drive means, including a pair of flexible link strings and means for winding and unwinding said strings, for causing movement of said screens; each of the link strings having a portion thereof extending through a respective one of said tubular passages and a pair of elongated metallic clamp members each being pressedly collapsed around a respective tubular passage so as to tightly hold the respective link strings and screens together.

3,906,532

APPARATUS FOR PREVENTING ABNORMAL CAMERA OPERATION

Yoshio Kuramoto, Toyonaka; Toshio Kobori, Sakai, and Hiroshi Ueda, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1974, Ser. No. 463,113

Claims priority, application Japan, Apr. 26, 1973, 48-46755

Int. Cl.² G03B 9/58

U.S. Cl. 354—258 **10 Claims**

1. A photographic camera having both electrical and mechanical shutter exposure time controls, comprising:

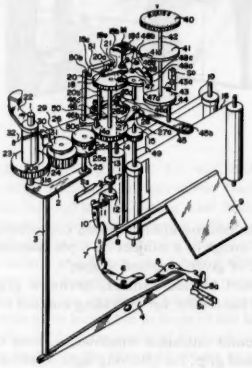
electrical control means including an electric power source and an electromagnet for controlling the exposure time of the camera shutter;

mechanical means for controlling the exposure time of the camera shutter;

means for selecting said electrical or mechanical control means;

means for winding the film and cocking the camera shutter;

a film winding control member movable between an operating position for locking said means for winding and a retracted position for releasing said means for winding, said winding control member being brought into said operating position in association with the completion of a shutter cocking and film winding operation;



detection means for detecting the initiation of shutter releasing and the energization of said electromagnet by said electrical control means with said means for selecting set for said electrical control means;

means for moving said winding control member from said operating position to said retracted position in response to said detection means detecting the energization of said electromagnet and for retaining said winding control member in said operating position in response to said detection means detecting the non-energization of said electromagnet; and

means for shifting said winding control member to said retracted position with said selecting means being switched from selecting said electrical control means to selecting said mechanical control means.

3,906,533

SINGLE LENS REFLEX CAMERA HAVING AN INTERLOCK ARRANGEMENT FOR PREVENTING LIGHT MEASUREMENT ERRORS

Kunio Mita, Kami-Fukuoka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1974, Ser. No. 493,714

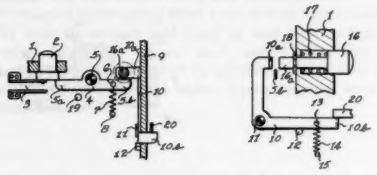
Claims priority, application Japan, Aug. 8, 1973, 48-92806

Int. Cl.² G03B 9/07

U.S. Cl. 354—272 **2 Claims**

1. In a single lens reflex camera having an electrically operated light measuring system and an electrical switch for oper-

ating the light measuring system, the lens having an adjustable diaphragm for controlling the aperture of the lens, the light measuring system being of the through-the-lens, full-aperture type that is subject to error when operated with the lens diaphragm set to less than full-aperture, the combination comprising:



first means, manually actuable when said switch is not operating the light measuring system, for adjusting the diaphragm so as to provide for previewing depth of field;

second means, manually actuable when said first means is not manually actuated, for causing said switch to operate the light measuring system; and

third means for interlocking said first and second means so that only one of the two at a time can be manually actuated.

3,906,534

DEVICE FOR MOUNTING AND DISMOUNTING AN INTERCHANGEABLE LENS

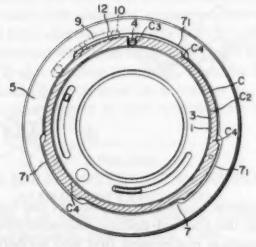
Takayuki Shirasaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,417

Claims priority, application Japan, Sept. 6, 1972, 47-103739

Int. Cl.² G03B *17/00, 7/02*

U.S. Cl. 354—286 **5 Claims**



1. An interchangeable lens having a device for mounting and dismounting it and comprising:

a lens barrel;

means for positioning the lens barrel against rotation with respect to a mounting member provided on a camera body, said positioning means being provided on said lens barrel and arranged to cooperate with mating positioning means on said mounting member;

a connecting member rotatably supported around the lens barrel, said connecting member having a first set of bayonet joint prong means for insertion between a second set of bayonet joint prong means provided on said mounting member while said connecting member is in a predetermined rotational position relative to said lens barrel and for securing the lens barrel to the mounting member of the camera by the rotation of said connecting member from said predetermined position; and

locking means provided partly in the lens barrel and partly in said connecting member for locking said connecting member against rotation relative to the lens barrel in said predetermined position;

said locking means being engageable with the mounting member, when the lens barrel is fully inserted in said mounting member and held against rotation therein by said positioning means, to release said locking means and thereby to permit rotation of the connecting member to engage said first set of bayonet joint prong means with said second set of bayonet joint prong means and complete the mounting of the lens barrel.

3,906,535

CAMERA WITH INTERCHANGEABLE PARTS

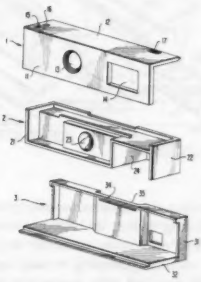
Sho Takahama, and Yoichi Hamada, both of Nishinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 16, 1973, Ser. No. 406,992

Claims priority, application Japan, Oct. 17, 1972, 47-103808

Int. Cl.² G03B *17/02*

U.S. Cl. 354—288 **2 Claims**



1. In a photographic camera having movable mechanisms including a shutter and film winding means, and stationary optical means including a taking lens and a view finder optical system, the improvement comprising:

a three part camera body, said body including a central body portion defined by rectangular end walls joined together by a vertical wall,

a first L-shaped wall portion including integral right angle front wall and top wall sections whose widths generally correspond to the width and height of said end walls of said central body portion, and

a second L-shaped wall portion, complementary to said first L-shaped wall portion and including integral right angle rear wall and bottom wall sections whose length and width correspond generally to those of said first L-shaped portion,

said first and second L-shaped wall portions being engageable with said central body portion on opposite sides thereof with the edges of respective wall sections of said first and second L-shaped wall portions in confronting position and forming with said central body portion an assembly of rectangular prism shape with said vertical wall of said central body portion being parallel to and spaced from said front wall section of said first L-shaped wall portion,

said first L-shaped wall portion having mounted thereto said camera movable mechanisms including said shutter and film winding means,

said front wall section being provided with a taking lens aperture and a view finder opening,

and said central body portion fixedly supporting said camera optical means with said vertical wall of said central body portion carrying said taking lens aligned with said taking lens aperture within said front wall section and said rear wall section being provided with an eyepiece opening

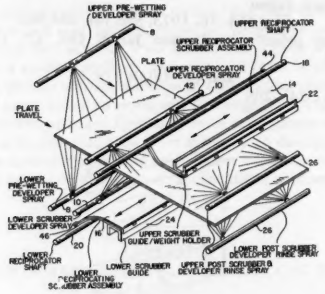
in alignment with said view finder opening within said front wall section, and said view finder optical system being carried by said central body portion and in alignment with said eye piece opening of said rear wall section and said view finder opening within said front wall section.

3,906,536

APPARATUS FOR PROCESSING PRINTING PLATES PRECOATED ON BOTH SIDES

Robert C. Graham, 10 Pierson Ln., Florham Park, N.J. 07932

Filed July 27, 1971, Ser. No. 166,414
Int. Cl. G03d *3/08*
U.S. Cl. 354—319 **6 Claims**



1. In an apparatus for simultaneously processing two sides of an offset printing plate, including means for dispensing developer solution onto two sides of the plate, developer means, washing means, gumming means and means for propelling the plate through the apparatus, the improvement comprising a developer means which includes a pair of opposed pad means, of a soft material, mounted in a manner to receive a plate between them, the upper one of said pad means being free-floating, whereby the pressure applied to a plate passing between said pad means is essentially the weight of said upper pad means assembly, and said pad means being reciprocatable transversely to the direction of plate travel.

3,906,537

SOLID STATE ELEMENT COMPRISING SEMI-CONDUCTIVE GLASS COMPOSITION EXHIBITING NEGATIVE INCREMENTAL RESISTANCE AND THRESHOLD SWITCHING

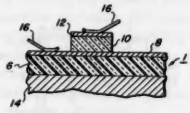
David D. Thornburg, Los Altos, and Richard I. Johnson, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

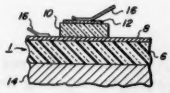
Filed Nov. 2, 1973, Ser. No. 412,211
Int. Cl.² H01L *27/24, 45/00*
U.S. Cl. 357—2 **9 Claims**

1. An array including at least first and second solid state elements,

said first solid state element including a first body of semiconductive glass and at least two spaced electrodes in contact with said first body of glass, said first body being co-extensive with a boundary defined by the contact loci between said first body of glass and said electrodes, such that said first solid state element exhibits a voltage-current characteristic having negative differential resistance behavior consisting of a generally high resistance region below a turnover voltage, a region of negative differential resistance, and a region of low resistance,

said second solid state element including a second body of semiconductive glass, and at least two spaced electrodes in contact with said second body of glass, said second body extending beyond the boundary defined by the contact loci between said second body of glass and at least one of the electrodes in contact with said second body, such that said second solid state element exhibits a voltage-current characteristic having threshold switching behavior consisting of a generally high resistance region below a turnover voltage and an abrupt transition to a low





resistance region which is not sustained below a certain current value,

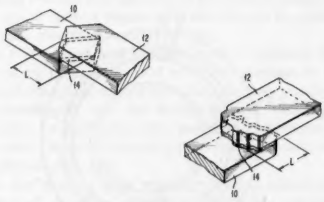
said first and second solid state elements being formed on a common supporting substrate, and said first and second bodies of semiconducting glass having similar compositions.

3,906,538

TECHNIQUES FOR MINIMIZING RESONANCE AMPLITUDES OF JOSEPHSON JUNCTION

Juri Matisoo, Yorktown Heights, and Hans H. Zappe, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1973, Ser. No. 422,960
Int. Cl.² H01L *39/22, 27/12, 45/00;* **H03K** *3/38*
U.S. Cl. 357—5 **9 Claims**



1. A Josephson tunnelling junction of the type having resonant steps in the current-voltage characteristic of said junction, said junction comprising first and second superconductors in contact with and separated by a tunnelling barrier, and said junction having a shape which reduces the amplitudes of said resonant steps.

3,906,539

CAPACITANCE DIODE HAVING A LARGE CAPACITANCE RATIO

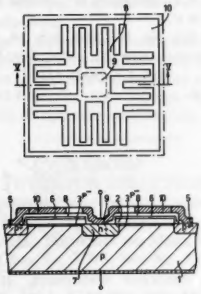
Heinz Sauermann, Hamburg, and Gerhard Winkler, Schenefeld, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 291,371, Sept. 22, 1972, abandoned.
This application Feb. 7, 1974, Ser. No. 440,598
Int. Cl.² H01L *29/92*
U.S. Cl. 357—14 **17 Claims**

1. A capacitance diode characterized by a large capacitance ratio, comprising:

a. a semiconductor body having a first major surface and comprising a first zone of first conductivity type disposed at said first surface;

b. a second zone of second opposite conductivity type located in said body at said first surface, said second zone being completely surrounded in said body by said first zone and forming a p, n junction with said first zone;
c. first and second connection electrodes contacting said first and second zones respectively, said second electrode contacting said body at only said second zone;
d. a channel-interrupting third zone of said first conductivity type located in said body at said first surface and surrounding said second zone, said second and third zones being spaced apart by portions of said first zone, said third zone having a higher doping impurity level than said first zone;



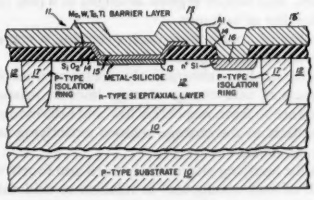
e. a surface layer disposed at said first surface between said second and third zones, said surface layer having a resistivity significantly higher than that of said first zone and having a net dopant concentration of said first conductivity type;
f. an electrically insulating first layer disposed on said first surface and covering at least the portion of said first surface located between said second and third zones; and
g. a field electrode disposed over a portion of said first layer, said field electrode extending to and being in electrical connection with said third zone, such that said field electrode is at a floating potential, whereby there can be formed in said surface layer an inversion layer extending from said second zone to said second zone to said third zone.

3,906,540

METAL-SILICIDE SCHOTTKY DIODE EMPLOYING AN ALUMINUM CONNECTOR

Brian E. Hollins, Los Altos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 346,969, April 2, 1973, abandoned. This application June 20, 1974, Ser. No. 481,043
Int. Cl.² H01L *29/48*
U.S. Cl. 357—15 **5 Claims**



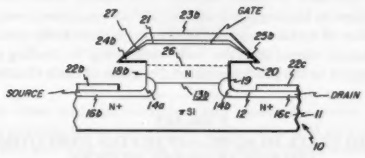
1. In a Schottky diode:
a silicon semiconductive substrate;
a metal-silicide layer overlaying said semiconductive substrate in abutting relation therewith to define a Schottky barrier at the interface of said metal-silicide layer with said silicon semiconductive substrate;
a refractory metal layer abutting in overlaying relation said metal-silicide layer for making electrical contact thereto; and
an aluminum metal layer abutting in overlaying relation said refractory metal layer for making electrical contact thereto.

3,906,541

FIELD EFFECT TRANSISTOR DEVICES AND METHODS OF MAKING SAME

Herbert Goronkin, Dewitt, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,020
Int. Cl.² H01L *29/80, 29/48, 29/06, 29/46*
U.S. Cl. 357—22 **10 Claims**



1. A field effect transistor comprising
a substrate of semiconductor material of high resistivity having a major surface including an elongated surface region having a pair of long edges,
an elongated source region of a first conductivity type and of low resistivity in said substrate contiguous to one of said pair of edges of said elongated surface region,
an elongated drain region of said first conductivity type and of low resistivity in said substrate contiguous to the other of said pair of long edges,
a projection of semiconductor material of said first conductivity type and of intermediate resistivity on said selected elongated surface region extending outward from said major surface for a predetermined distance and thereafter extending substantially parallel to said major surface to provide portions overhanging said elongated surface region, said projection being an epitaxial extension of said substrate,
each of the exposed portions of said source region and of said drain region having a respective conductive layer thereon,
means forming a rectifying contact with said projection

3,906,542

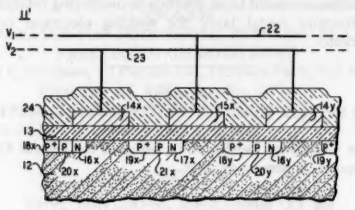
CONDUCTIVELY CONNECTED CHARGE COUPLED DEVICES

Robert Harold Krambeck, South Plainfield; George Elwood Smith, Murray Hill, and Robert Joseph Strain, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 14, 1972, Ser. No. 262,787
Int. Cl.² H03K *3/353*
U.S. Cl. 357—24 **7 Claims**

1. Semiconductive apparatus including a semiconductive silicon storage medium the bulk of which is of one conductivity type, a silicon dioxide insulating layer over one surface of the medium, and an electrode assembly over the insulating layer comprising a succession of spaced electrodes, alternate electrodes being directly interconnected to form two sets of electrodes and adjacent electrodes being electrically isolated,

further characterized in that along said one surface the medium comprises a first succession of degenerately doped surface zone means of the opposite conductivity type underlying and substantially coextensive with the effective gaps between adjacent electrodes for facilitating the transfer of charge carriers between successive storage sites located at surface regions of the medium underlying the electrodes and for avoiding



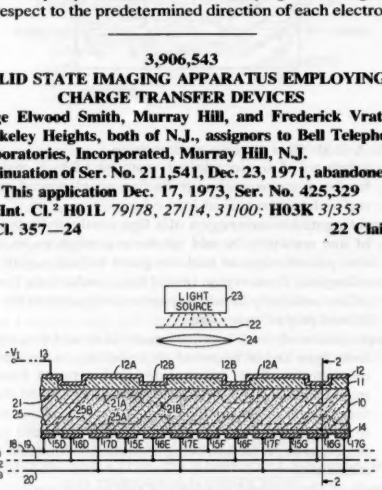
complete depletion even in the absence of signal charge during operation, the trailing portion with respect to a predetermined direction of each surface zone being more heavily doped than its leading portion, and further comprises a second succession of surface regions, of the one conductivity type but more heavily doped than the bulk, underlying the trailing edge with respect to the predetermined direction of each electrode.

3,906,543

SOLID STATE IMAGING APPARATUS EMPLOYING CHARGE TRANSFER DEVICES

George Elwood Smith, Murray Hill, and Frederick Vratny, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 211,541, Dec. 23, 1971, abandoned.
This application Dec. 17, 1973, Ser. No. 425,329
Int. Cl.[2] H01L *79/78, 27/14, 31/00;* **H03K** *3/353*
U.S. Cl. 357—24 **22 Claims**



1. Charge transfer imaging apparatus comprising:

a photosensitive semiconductor wafer having a pair of substantially parallel surfaces on opposite sides thereof, at least one of the pair being suitable for charge transfer device operation;

a transparent first dielectric layer disposed over and contiguous with a first one of said surfaces;

a transparent conductive sheet disposed substantially over said first dielectric layer;

first circuit means coupled to the conductive sheet for applying thereto a first voltage sufficient to form in combination with said wafer, layer and sheet a matrix of potential wells adjacent to said one surface in said wafer for storage of mobile charge carriers generated in said medium;

a second dielectric layer disposed over and contiguous with the other of said surfaces;

a plurality of charge transfer information channels disposed over and including said second layer and said other surface, each including a row of a plurality of spaced, localized electrodes disposed over the second layer;

second circuit means coupled to the electrodes of the information channels for applying voltages thereto sufficient for effecting simultaneous collection of the charge carriers stored in said potential wells and for effecting charge transfer along said channels;

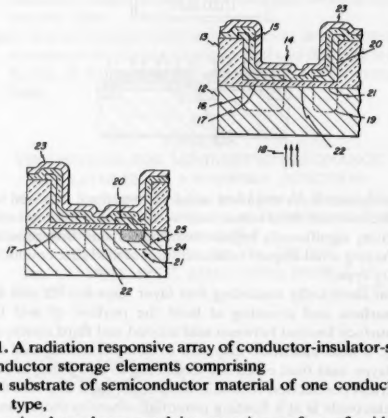
the wafer being sufficiently thin that mobile charge carriers stored in the potential wells associated with the front surface can be transferred through the wafer to the potential wells of the charge transfer information channels associated with the other surface without incurring avalanche breakdown in the wafer.

3,906,544

SEMICONDUCTOR IMAGING DETECTOR DEVICE

William E. Engeler, Scotia, and Jerome J. Tiemann, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 162,584, July 14, 1971, abandoned.
This application Apr. 22, 1974, Ser. No. 462,924
Int. Cl. H01I *11/14*
U.S. Cl. 357—24 **5 Claims**



1. A radiation responsive array of conductor-insulator-semiconductor storage elements comprising

a substrate of semiconductor material of one conductivity type,

an insulator layer overlying a major surface of said substrate, said insulator layer having a plurality of cellular regions therein each of substantially lesser thickness than surrounding regions thereof, said cellular regions arranged into a pair of rows and a plurality of columns,

a pair of charge storage lines each overlying and contiguous with the cellular regions of a respective row and defining a respective row of charge storage regions in an underlying surface adjacent portion of said substrate,

a region of opposite conductivity type in said surface adjacent portion of said substrate spaced from each of said charge storage regions and forming a plurality of charge receive regions each spaced from a respective charge storage region and defining a respective barrier therebetween, said barrier regions arranged in a pair of rows and a plurality of columns,

a plurality of conductors, each overlying a respective column of barrier regions,

means for applying alternatively a first and a second voltage to each of said charge storage lines in relation to said substrate to form respective low and intermediate surface potentials in the storage regions underlying said charge storage lines,

means for applying alternatively third and fourth voltages to each of said conductors in relation to said substrate for establishing surface potentials at said barrier regions to control the transfer of electrical charge between charge storage regions and charge receive regions, said third voltage on said conductors being set in relation to said

second voltage on said storage lines to inhibit the transfer of charge from said charge storage regions to said charge receive regions and said fourth voltage on a conductor being set in relation to said second voltage on a storage line to permit the transfer of charge from the charge storage region so addressed to a corresponding charge received region,

means for establishing a potential in said region of opposite conductivity type which is below the potential established at said barrier regions in response to the application of said fourth voltage to said conductors overlying said barrier regions,

means for applying said first voltage to one of said storage lines while applying said second voltage to the other of said storage lines,

means for applying said fourth voltage to a selected column conductor while applying said third voltage to the other column conductors,

whereby charge is transferred from a storage region of said other row addressed by said selected column conductor to said region of opposite conductivity type and no charge is transferred from the other storage regions of said rows to said region of opposite conductivity type.

3,906,545

THYRISTOR STRUCTURE

Heinrich Schlangenotto, Neu-Isenburgh, and Kurt Roy, Obertshausen, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

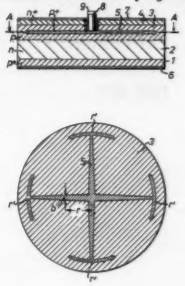
Filed Jan. 24, 1973, Ser. No. 326,275

Claims priority, application Germany, Jan. 24, 1972, 2203156; Apr. 6, 1972, 2216494; July 10, 1972, 2233786; Aug. 22, 1972, 2241217

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **15 Claims**

1. In a thyristor having a semiconductor body with four zones of alternating conductivity types in which the two outer zones, being the anode and cathode zones respectively, are of a high conductivity and the two inner zones, being the base and the gate zones respectively, are of a low conductivity, the gate zone forms a separate pn-junction with each of the cathode and the base zones, the base zone forms a further *pn*-junction with the anode zone, and a gate electrode is coupled to the gate zone for supplying a signal thereto for firing the thyristor, the improvement wherein: a contiguous control zone which consists of semiconductor material of the same conductivity type as said gate zone but has a higher doping concentration than said gate zone, is disposed within said gate zone and has a plurality of interconnected narrow control paths which extend over the cross-sectional area of said gate zone, said control zone borders the pn-junction between the



gate zone and said cathode zone; a control contact is ohmically connected to said control zone and to said gate electrode so that said gate electrode is ohmically connected to said gate zone via said control zone; said cathode zone covers at most only a portion of said control paths which border the area of the *pn*-junction between said gate zone and said cathode zone thus forming exposed regions of said control zone; said exposed regions are wider than said control current paths so that said exposed regions enclose the exposed portions of said control paths; and the width (b) of said exposed regions decreases with increasing distance (r) extending from said control contact.

DESIGN PATENTS

GRANTED SEPTEMBER 16, 1975

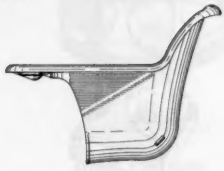
ERRATA

For CLASS	See PATENT NO.
007–187	236,796
012–111	236,803

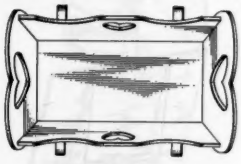
DESIGNS

SEPTEMBER 16, 1975

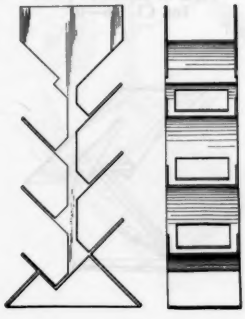
236,766
CHILD'S SWING SEAT
Gregory B. Speer, St. Clairsville, Ohio, assignor to Blazon-Flexible Flyer, Inc., Medina, Ohio
Filed Dec. 20, 1973, Ser. No. 426,959
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—10



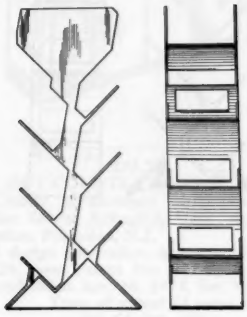
236,767
CRADLE
John W. McKelvey, 4306 Lynd Ave., Arcadia, Calif. 91006
Filed Feb. 14, 1974, Ser. No. 442,523
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—15



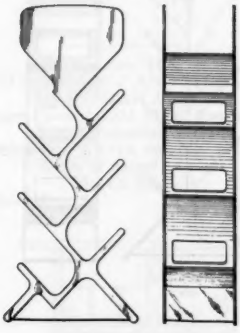
236,768
DISPLAY STAND
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Oct. 16, 1973, Ser. No. 406,981
Claims priority, application Italy Apr. 17, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



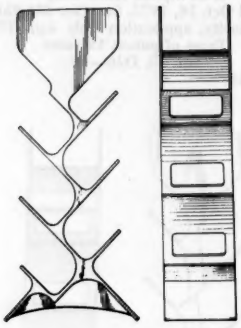
236,769
DISPLAY STAND
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Oct. 16, 1973, Ser. No. 406,988
Claims priority, application Italy Apr. 17, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



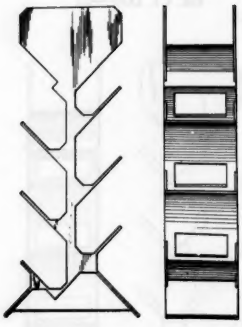
236,770
DISPLAY STAND
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Oct. 16, 1973, Ser. No. 406,989
Claims priority, application Italy Apr. 17, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



236,771
DISPLAY STAND
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Oct. 16, 1973, Ser. No. 406,990
Claims priority, application Italy Apr. 17, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



236,772
DISPLAY STAND
Amilcare Dogliotti, Neive, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Oct. 16, 1973, Ser. No. 406,995
Claims priority, application Italy Apr. 17, 1973
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

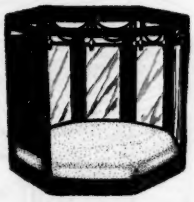


236,773
DISPLAY RACK
John F. Deffner, 5705 Westview Lane, Lisle, Ill. 60532
Filed Oct. 23, 1973, Ser. No. 408,284
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—25

236,774
DRAFTING TABLE
Gary Cowley, 2331 Main, Vancouver, British Columbia, Canada
Filed Oct. 2, 1973, Ser. No. 402,772
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

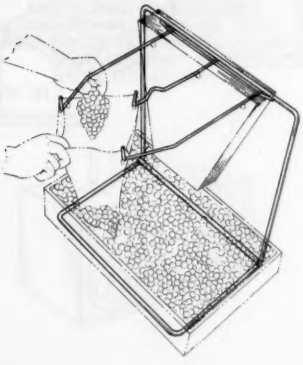
236,775
SINGLE PEDESTAL DRAFTING TABLE
Gary Cowley, 2331 Main, Vancouver, British Columbia, Canada
Filed Oct. 2, 1973, Ser. No. 402,773
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

236,776
COMBINED BED AND ENCLOSURE
Robert B. Phillips, 462 Plymouth Drive, and Larry H. Hunt, 2218 Harrodsburg Road, both of Lexington, Ky. 40503
Filed July 13, 1973, Ser. No. 379,080
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

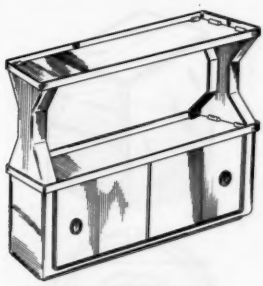


236,777
DISPLAY UNIT
Roland E. Loomis, Menlo Park, Calif., assignor to House of Health, Inc., Santa Clara, Calif.
Filed July 16, 1973, Ser. No. 379,775
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

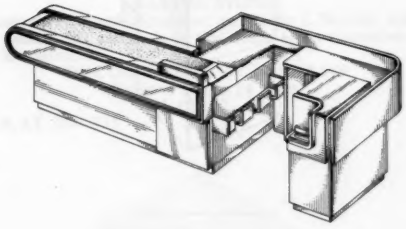
236,778
COMBINED BAG STORAGE AND FILLING RACK
Arthur Adolph Thiere, West Covina, and Raymond Harold Sanders and George Edwin Johnson, Ontario, Calif., assignors to Standun, Inc.
Filed Jan. 21, 1974, Ser. No. 435,297
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



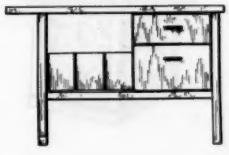
236,779
STORAGE CABINET
Ralph M. Nowak, Wilbraham, Mass., assignor to Tucker Manufacturing Corporation, Columbus, Ind.
Filed Dec. 26, 1973, Ser. No. 427,984
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127



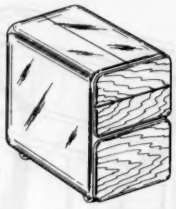
236,780
CHECK-OUT COUNTER OR SIMILAR ARTICLE
Thomas Charles Abrahamsen, Birmingham, Mich., and John Dino Zaccai, Arlington, Mass., assignors to RCA Corporation, Princeton, N.J.
Original design application Apr. 20, 1972, Ser. No. 246,120, now Patent No. 234,037. Divided and this application Apr. 10, 1974, Ser. No. 459,602
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—143



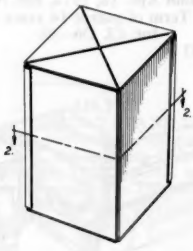
236,781
COMBINED BOOKSHELF AND STORAGE CABINET OR SIMILAR ARTICLE
Gary Cowley, 2331 Main, Vancouver, British Columbia, Canada
Filed Oct. 2, 1973, Ser. No. 402,774
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—165



236,782
CABINET
William B. Sklaroff, Narberth, Pa., assignor to Tiffany Industries, Inc., St. Louis, Mo.
Filed Mar. 20, 1974, Ser. No. 452,795
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—165

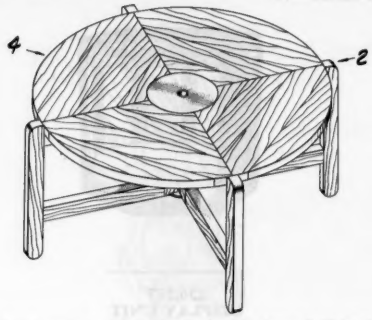


236,783
EXHIBIT DISPLAY APPARATUS
William E. Muempfer, South Bend, Ind., assignor to Exhibitech, Inc., South Bend, Ind.
Filed July 14, 1972, Ser. No. 271,823
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—168

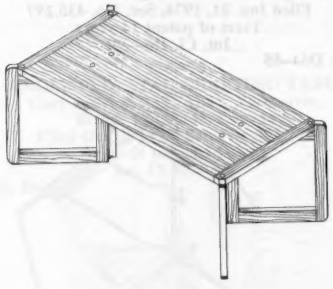


236,784
COIN DISPLAY CASE
Bertram H. Kapnek, 8106 Douglas Road, Philadelphia, Pa. 19118
Filed Oct. 4, 1973, Ser. No. 403,699
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—168

236,785
TABLE
Dale D. Smith, Irvine, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Jan. 14, 1974, Ser. No. 433,271
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

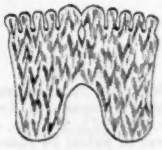


236,786
TABLE
Dale D. Smith, Irvine, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Jan. 25, 1974, Ser. No. 436,525
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

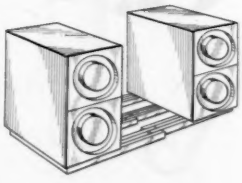


236,787
BOOKCASE OR SIMILAR ARTICLE
Loren D. Stirling, Pleasanton, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 3, 1973, Ser. No. 420,826
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184

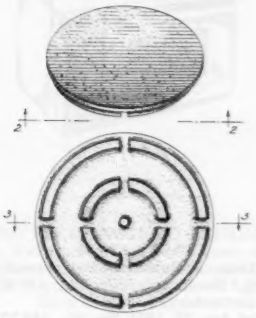
236,788
THROW RUG
Archie E. Warnberg, Oklahoma City, Okla.
Continuation-in-part of abandoned design application Ser. No. 26,414, Dec. 11, 1970. This application Mar. 2, 1973, Ser. No. 337,731
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—212



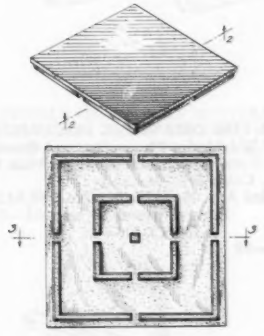
236,789
COMBINED CANISTER AND ADJUSTABLE BOOKRACK
John Y. Park, Marlboro, Mass.
(2 Water View Terrace, Southboro, Mass. 01772)
Filed Aug. 27, 1973, Ser. No. 391,649
Term of patent 7 years
Int. Cl. D7—*07*; D6—*06*
U.S. Cl. D7—81



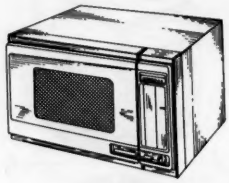
236,790
BAKING STONE
Pasquale N. Bruno, Elmhurst, and James L. Stewart, Lake Zurich, Ill., assignors to Old Stone Oven Corporation, Elmhurst, Ill.
Filed July 9, 1973, Ser. No. 377,573
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—123



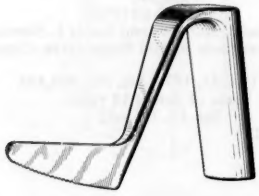
236,791
BAKING STONE
Pasquale N. Bruno, Elmhurst, and James L. Stewart, Lake Zurich, Ill., assignors to Old Stone Oven Corporation, Elmhurst, Ill.
Filed Oct. 23, 1973, Ser. No. 408,648
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—123



236,792
ELECTRONIC COOKING RANGE
Takao Miyake, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corporation), Osaka, Japan
Filed July 22, 1974, Ser. No. 490,308
Claims priority, application Japan Jan. 25, 1974
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



236,793
TABLE KNIFE
Maria Benktzon, Sollentuna, and Sven-Eric Juhlin, Gustavsberg, Sweden, assignors to AB Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Apr. 10, 1974, Ser. No. 459,773
Claims priority, application Sweden Oct. 10, 1973
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

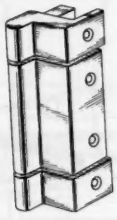


236,794
TOOL FOR DEBINDING DOCUMENTS
Theodore A. D'Addario, Pleasanton, and David R. Estes, Mountain View, Calif., assignors to Velo Bind, Inc., Sunnyvale, Calif.
Filed Apr. 13, 1973, Ser. No. 350,933
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

236,795
DOOR KNOCKER OR THE LIKE
Rudolph Paulich, Mercer Island, Wash., assignor to Columbia Specialty Co., Inc., Seattle, Wash.
Filed May 3, 1974, Ser. No. 466,612
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D8—177

236,796
MOP PAIL
Fritz Deuschle, St. Louis, Mo., assignor to Schlueter Manufacturing Company, St. Louis, Mo.
Filed Nov. 21, 1973, Ser. No. 418,099
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—187

236,797
HINGE
M. Vincent Sanderford and Philip J. Davis, Morganton, N.C., assignors to Champion International Corporation, Hamilton, Ohio
Filed Sept. 14, 1973, Ser. No. 392,202
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—195



236,798
POST ANCHOR
Wayne F. Hall, 2911 Bankers Drive, Bloomington, Ind. 47401
Filed Sept. 10, 1973, Ser. No. 395,956
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—234

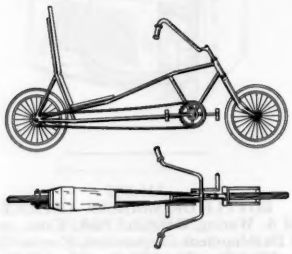
236,799
SQUEEZE DISPENSER FOR CLEANING FLUID OR THE LIKE
Lucian Kapuscinski, Atlanta, Ga., assignor to Intex Products, Inc., Greenville, S.C.
Filed Mar. 26, 1973, Ser. No. 344,604
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2

236,800
BOTTLE
John Pardo, 30 Roberts Lane, Yonkers, N.Y. 10701
Filed Oct. 9, 1973, Ser. No. 404,510
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111

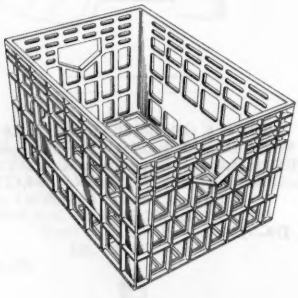
236,801
BOTTLE OR SIMILAR ARTICLE
Donald A. Waring, Overland Park, Kans., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed Dec. 29, 1972, Ser. No. 319,204
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—137

236,802
BOTTLE OR SIMILAR ARTICLE
John W. McDonald, Kansas City, Mo., assignor to Ethyl Development Corporation, Kansas City, Mo.
Filed Nov. 8, 1972, Ser. No. 304,623
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

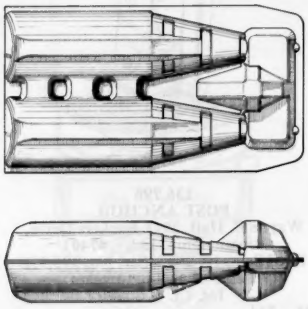
236,803
BICYCLE
Gregory A. Ennis, 3905 Braun Ave., Oakland, Calif. 94619
Filed Aug. 5, 1974, Ser. No. 494,496
Term of patent 7 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



236,804
MILK CRATE
Alfred G. Stauble, Box 17, Hollis, N.H. 03049
Filed Mar. 29, 1973, Ser. No. 345,889
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177

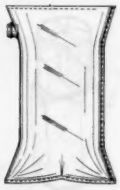


236,805
PACKAGE FOR ICE CREAM CONES OR THE LIKE
Paul Davis, Swampscott, and David Schneider, Lexington, Mass., and Paul Hollinger, Pikesville, Md., assignors to Sweetheart Plastics Inc., Wilmington, Mass.
Filed Jan. 31, 1974, Ser. No. 438,267
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183

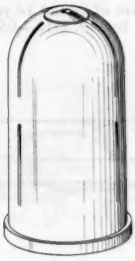


236,806
RECEPTACLE FOR PASTE-PERFUMERY
Yasui Kumai, Okegawa, Japan, assignor to Shiseido Co., Ltd., Tokyo, Japan
Filed Feb. 9, 1973, Ser. No. 331,236
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

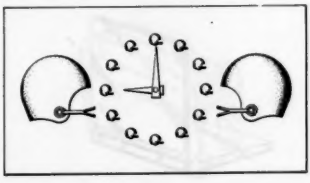
236,807
DISPENSING POUCH FOR LIQUIDS
Justin M. Schmit, Pompano Beach, Fla., assignor to Arctic Pac, Inc., Fort Lauderdale, Fla.
Filed Oct. 3, 1972, Ser. No. 294,536
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—194



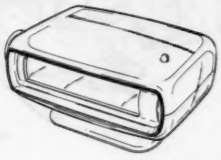
236,808
THREAD CANISTER
Philippe Hardy-The McLain, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.
Filed Sept. 6, 1973, Ser. No. 394,753
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



236,809
CLOCK
Richard Silva, 835 Serra Drive, San Leandro, Calif. 94578
Filed Mar. 27, 1974, Ser. No. 455,495
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6



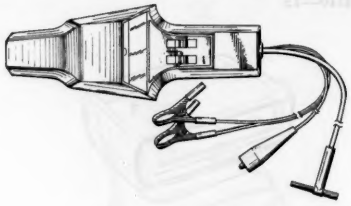
236,810
DIGITAL CLOCK
Nobuyoshi Hirosawa, Nagano-ken, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Shimosuwa-machi, Suwa-gun, Nagano-ken, Japan
Filed June 13, 1973, Ser. No. 369,611
Claims priority, application Japan Apr. 24, 1973
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



236,811
STOP WATCH
André Meylan, Moutier, Switzerland, assignor to Heuer Leonidas S.A.
Filed Aug. 17, 1973, Ser. No. 389,198
Claims priority, application Switzerland Mar. 13, 1973
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

236,812
BELL TIMER
James A. Draghi, Canton, Conn., assignor to M. H. Rhodes, Inc., Avon, Conn.
Filed Apr. 12, 1974, Ser. No. 460,308
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

236,813
AUTOMOTIVE ENGINE TESTER
Dennis J. Lowery and Vincent H. Rose, Grand Junction, Colo., assignors to Dixson, Inc., Grand Junction, Colo.
Filed Sept. 26, 1973, Ser. No. 400,891
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

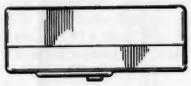


236,814
ELECTRONIC THERMOMETER
Stephens N. Sato, San Diego, Calif., assignor to IVAC Corporation, La Jolla, Calif.
Filed July 30, 1973, Ser. No. 384,032
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

236,815
THERMOCHROMIC THERMOMETER
Philip L. Van Kersen, P.O. Box 40423, Indianapolis, Ind. 46240
Filed Mar. 18, 1974, Ser. No. 451,937
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

236,816
PRESSURE GAUGE
Clyde J. Martin, Cincinnati, Ohio, assignor to Martin Industries, Inc.
Filed Mar. 20, 1974, Ser. No. 452,903
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85

236,817
AUDIBLE ALARM
Louis P. Sweany, Carmel, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Aug. 29, 1973, Ser. No. 392,669
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106



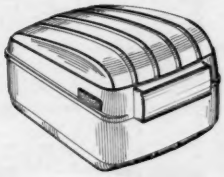
236,818
RETROREFLECTIVE MARKER FOR ATTACHMENT TO SURFACES ADJACENT ROADWAYS
Heinrich F. Stenemann, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Mar. 26, 1974, Ser. No. 454,954
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

236,819
FRAME FOR A RAILROAD RAIL GRINDING MACHINE
Willard J. Duecker, Stockton, Calif., assignor to Colberg, Inc.
Filed June 10, 1974, Ser. No. 478,073
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—42

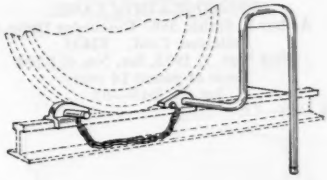
236,820
UTILITY VAN HAVING EXTERNALLY ACCESSIBLE COMPARTMENTS
Leo A. Hamel, 30 Union St., Cambridge, Mass. 02141
Filed Aug. 9, 1973, Ser. No. 386,944
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—99

236,821
MOTORCYCLE SADDLE BAG
Harold H. Larsen, Long Beach, and Robert E. Oehring, Norwalk, Calif., assignors to Bates Industries, Inc., Long Beach, Calif.
Filed Mar. 14, 1974, Ser. No. 451,041
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

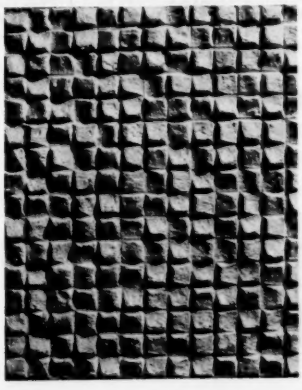
236,822
MOTORCYCLE TOTE BOX
Harold H. Larsen, Long Beach, and Robert E. Oehring, Norwalk, Calif., assignors to Bates Industries, Inc., Long Beach, Calif.
Filed Mar. 14, 1974, Ser. No. 451,224
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



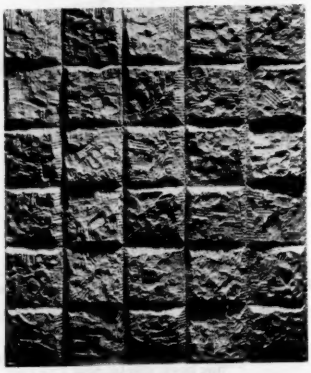
236,823
COMBINED WHEEL CHOCKS AND FLAG
Ralph V. Switzer, 3338 Ravenswood Ave., Chicago, Ill. 60657
Filed July 12, 1973, Ser. No. 378,680
Term of patent 14 years
The term of this patent subsequent to Dec. 13, 1980, has been disclaimed
Int. Cl. D12—*16*
U.S. Cl. D12—217



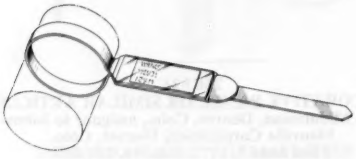
236,824
DECORATIVE PANEL OR SIMILAR ARTICLE
Leo Middleman, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Filed June 5, 1972, Ser. No. 260,066
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



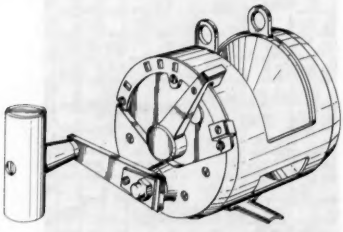
236,825
DECORATIVE PANEL OR SIMILAR ARTICLE
Leo Middleman, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Filed June 5, 1972, Ser. No. 260,071
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



236,826
IDENTIFICATION LABEL
Arthur L. Smith, 3507 Rosehedge Drive, Fullerton, Calif. 92635
Filed Nov. 1, 1973, Ser. No. 411,784
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—13

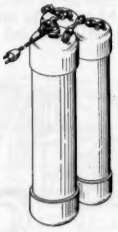


236,827
CASTING REEL FOR SEA-FISHING
Kent Tufvesson, Karlshamn, Sweden, assignor to ABU AB, Svangsta, Sweden
Filed Aug. 17, 1973, Ser. No. 389,220
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

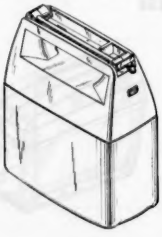


236,828
FISHING LURE
Charles W. McLaughlin, 516 E. Jefferson, Clinton, Mo. 64735
Filed July 22, 1974, Ser. No. 490,399
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

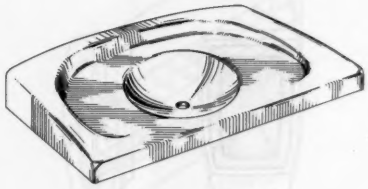
236,829
WATER PURIFICATION UNIT
William J. Berry, Jr., and William J. Berry III, Durham, N.C., assignors to R & D Suppliers, Inc., Durham, N.C.
Filed Jan. 15, 1973, Ser. No. 323,806
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



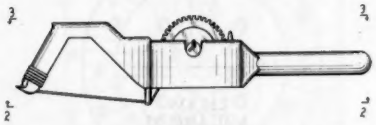
236,830
CORDLESS ELECTRIC SPRAYER
Carl E. Bochmann, Brecksville, and Donald E. Watkins, Parma, Ohio, assignors to H. D. Hudson Manufacturing Company
Filed Mar. 1, 1974, Ser. No. 447,095
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

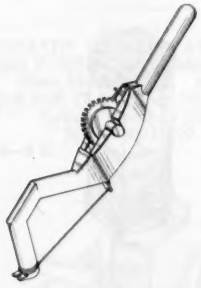


236,831
LAVATORY
George M. Myers, 3148 N. 47th Drive, Phoenix, Ariz. 85013
Filed June 19, 1974, Ser. No. 480,954
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

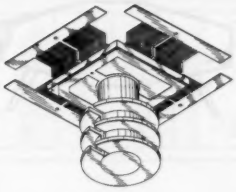


236,832
DENTAL FLOSS APPLICATOR
Wayne B. Jennings, 114 Cloverleaf Drive, Athens, Ala. 35611
Filed Aug. 16, 1973, Ser. No. 388,758
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

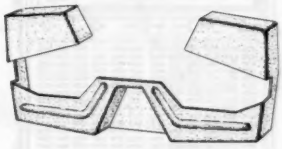




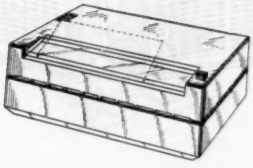
236,833
INTEGRATED CIRCUIT PACKAGE
Robert J. Beall, San Jose, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.
Filed July 24, 1972, Ser. No. 274,459
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1 R



236,834
FANFOLD PAPER TAPE SUPPLY-TAKEUP STRUCTURE
Betty L. McClurg, Arcadia, and Michael W. Grey, Temple City, Calif., assignors to Addmaster Corporation, San Gabriel, Calif.
Filed Aug. 15, 1973, Ser. No. 388,382
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

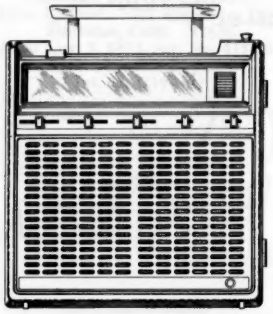


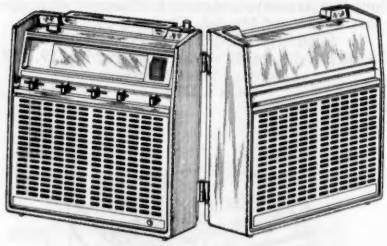
236,835
DATA PRINTER OR SIMILAR ARTICLE
Herbert Kramer, Furstenfeldbruck, and Tonis Kao, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Sept. 12, 1973, Ser. No. 397,124
Claims priority, application Germany Mar. 19, 1973
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



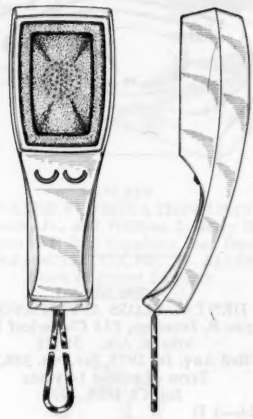
236,836
SPEAKER CABINET
John R. Cerra, Omaha, Nebr.
(1405 Early St., Sac City, Iowa 50583)
Filed July 30, 1973, Ser. No. 383,571
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

236,837
PORTABLE 8-TRACK STEREO TAPE PLAYER
Richard E. Lee, Cazenovia, and Richard Culbertson, Manlius, N.Y., assignors to General Electric Company
Continuation-in-part of abandoned design application Ser. No. 413,520, Nov. 7, 1973. This application Apr. 1, 1974, Ser. No. 456,932
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 B



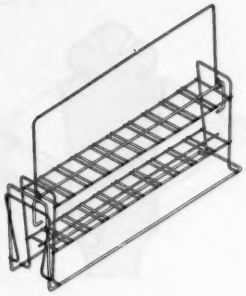


236,838
RECEIVER CHASSIS FOR TOUR GUIDE SYSTEMS
Anthony S. Valente, Bernardsville, N.J., assignor to Telesonic Systems Inc., Fairfield, N.J.
Filed Oct. 31, 1974, Ser. No. 519,715
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K

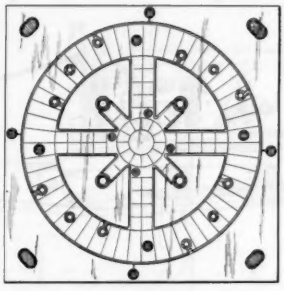


236,839
AQUARIUM
Henry J. Polli, 115 Cedarlawn Drive, Dayton, Ohio 45415
Filed June 21, 1973, Ser. No. 372,215
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8

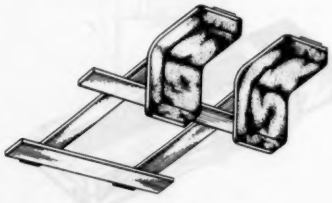
236,840
WIRE TEST TUBE RACK
James William Farrough, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Nov. 12, 1973, Ser. No. 414,925
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D32—1



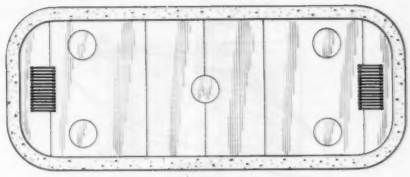
236,841
GAME BOARD
Virgil M. Santos, 264 Bergen Ave., Kearney, N.J. 07032
Filed Aug. 9, 1973, Ser. No. 387,020
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



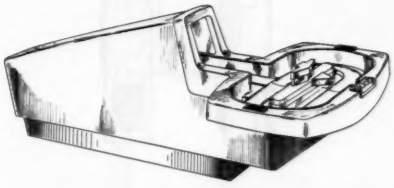
236,842
GYMNASTIC EXERCISE APPARATUS
Kirk Z. Wilson, 919 Wilshire Blvd., Santa Monica, Calif. 90401
Filed Sept. 17, 1973, Ser. No. 397,582
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K



236,843
HOCKEY WORD GAME BOARD
Kathleen C. Osmundson, 518 8th St., Virginia, Minn. 55792
Filed Oct. 30, 1973, Ser. No. 411,076
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

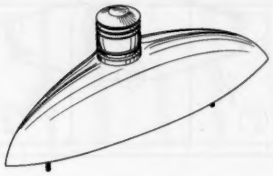


236,844
BOWLING LANE BALL RETURN
Thomas A. Meade, Huntington, N.Y., assignor to AMF Incorporated, White Plains, N.Y.
Filed Jan. 24, 1974, Ser. No. 436,063
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 DD

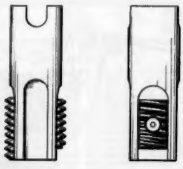


236,845
EDIBLE SPINNING TOY
Carlos Benaim, 4855 Vezina, Suite 15, Montreal 252, Quebec H3W 1B9, Canada
Filed Dec. 10, 1973, Ser. No. 423,210
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 D

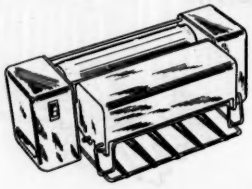
236,846
STROBOSCOPIC LIGHT UNIT HOUSING FOR AIRCRAFT
Cecil P. Bishop, 1401 Nob Hill Road, San Marcos, Calif. 92069
Filed May 13, 1974, Ser. No. 469,118
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



236,847
TAP
Edward J. Delaney, Valley Parkway E., Joliet, Ill. 60433
Filed Jan. 7, 1974, Ser. No. 431,054
Term of patent 14 years
Int. Cl. D8—*05;* D15—*99*
U.S. Cl. D54—4

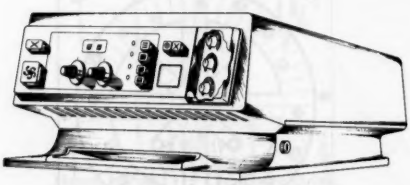


236,848
PANCAKE MAKING APPLIANCE
Paul A. Marrie, Dijon, France
Filed July 23, 1974, Ser. No. 491,151
Claims priority, application France Feb. 11, 1974
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D55—1 E

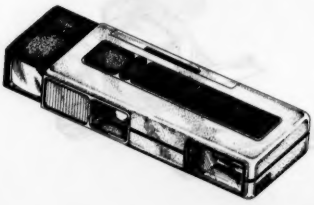


236,849
GUITAR HEAD
Bozo Podunavac, 3851 Lincoln Ave., Chicago, Ill. 60613
Filed Jan. 26, 1973, Ser. No. 326,607
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

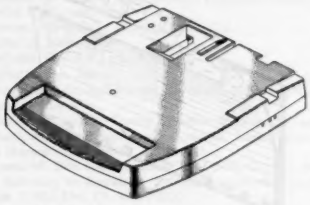
236,850
CONTROL PANEL FOR A COPIER
Ruediger W. Knodt, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 16, 1973, Ser. No. 342,241
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



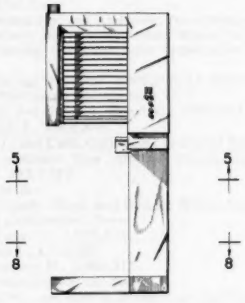
236,851
PHOTOGRAPHIC CAMERA
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 4, 1973, Ser. No. 403,448
Term of patent 14 years
The term of this patent subsequent to May 18, 1989, has been disclaimed
Int. Cl. D16—*01*
U.S. Cl. D61—1 B

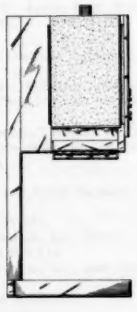


236,852
FILM CARTRIDGE
Carter Keith Reh, Santa Ana, and Cyril E. Fankhouser III, Costa Mesa, Calif., assignors to United Visuals Corporation, Los Angeles, Calif.
Filed Oct. 26, 1973, Ser. No. 410,183
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 T

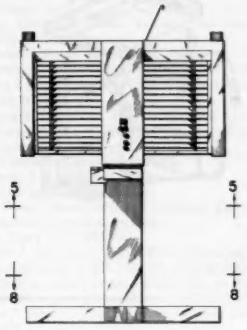


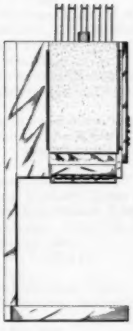
236,853
DOCUMENT SORTER
Louis J. H. Lucker, Tegelen, and Theo P. C. Breuers, Venlo, Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands
Filed Aug. 1, 1974, Ser. No. 494,352
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R



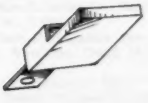


236,854
DOCUMENT SORTER
Louis J. H. Lucker, Tegelen, and Theo P. C. Breuers, Venlo, Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands
Filed Aug. 1, 1974, Ser. No. 494,355
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R





236,855
AUTOMOBILE WINDSHIELD FRAME MOUNTABLE RADIO TRANSMITTER HOLDER
Raymond G. Hegel, 10818 Roundelay Circle, Sun City, Ariz. 85351
Filed Sept. 26, 1973, Ser. No. 401,036
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



236,856
BACK PACK COOLER
Fidelis L. Miller, 961 S. Ash, Tempe, Ariz. 85281
Filed Dec. 18, 1973, Ser. No. 425,737
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

236,857
WALLET
Gordon D. Lookatch, 6200 N. Sunny Point Road, Glendale, Wis. 53217
Filed July 5, 1973, Ser. No. 376,326
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF SEPTEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Ardal og Sunndal Verk: *See—*
Alfarnes, Otto; and Hauknes, Knut, 3,905,647.

AB Braas Spegelindustri: *See—*
Holmqvist, Per Goran; and Eliasson, Lars Erik Bertil, 3,905,687.

AB Broderna Kjellstrom: *See—*
Kjellstrom, Alvar Eskil Petrus, 3,905,612.

AB Hagglund & Soner: *See—*
Westerlund, Gunnar J., 3,905,636.

Abbott Laboratories: *See—*
Somani, Pitambar; and Martin, Donald Lyons, 3,906,107.

Abe, Kazumasa: *See—*
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.

Abert, Dennis M. Box construction. 3,905,540, Cl. 229-16.00R.

Abolafia, Antonio, to Excelsior Belting-Equipment Co., Inc. Steam iron shoe. 3,905,138, Cl. 38-97.000.

Absler, Howard K.: *See—*
Juszak, Joseph J.; and Absler, Howard K., 3,905,545.

Abu Aktiebolag: *See—*
Murvall, Ake Eugen, 3,905,249.

Adachi, Kinichi: *See—*
Yoshino, Kimiaki; Adachi, Kinichi; Shimotsuma, Wataru; Sekine, Yoichi; and Shimizu, Toshio, 3,905,876.

Adams, Arnold G.: *See—*
Fiddler, Theodore E.; and Adams, Arnold G., 3,906,178.

Adams, Charles De Witt: *See—*
Schlatter, Rudolph; and Adams, Charles De Witt, 3,905,991.

Adams, David: *See—*
Adams, John Q.; and Adams, David, 3,905,595.

Adams, John Q.; and Adams, David, to I.D. Inc. Sheet stacker. 3,905,595, Cl. 271-217.000.

Adams, Richard G.: *See—*
Blewett, Donald A.; and Adams, Richard G., 3,905,855.

Adams-Russell Co.: *See—*
Gooding, Dennis Jay; and Anderson, Peter Holden, 3,906,400.

Addis, John Lindsey; and Peltola, Ronald Wayne, to Tektronix, Inc. Oscilloscope having selectable input impedances. 3,906,344, Cl. 324-121.00R.

Addis, Tim. Fecal egg separator. 3,905,895, Cl. 209-17.000.

Addressograph Multigraph Corporation: *See—*
See, Gary G.; and Gardner, Joseph G., 3,905,293.
Szabo, Francis S., 3,905,699.

Adrian, Donald J.; and Cash, Carlton H., to United States of America, Navy. Autocorrelation type spectral comparison fuze system. 3,906,493, Cl. 343-7.0PF.

AER Corporation: *See—*
Villalobos, Joseph Alfred; and Elnicki, Walter Joseph, 3,905,126.

Aerojet-General Corporation: *See—*
Allemann, James G., 3,905,515.
David, Ernest J., 3,905,903.
Gotisar, Theodore H., 3,906,315.

Aeronutronic Ford Corporation: *See—*
Verma, Jugal K.; and Keprta, Buran I., Jr., 3,906,506.

Agency of Industrial Science & Technology: *See—*
Tanaka, Keiichi, 3,906,394.

Agran, Jack: *See—*
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, 3,905,919.

Ahlborn, Hans: *See—*
Betz, Hans; Merz, Dietrich; Winter, Heinrich; and Ahlborn, Hans, 3,905,083.

Ahlers, William H.; Derr, Robert E.; and Sahling, La Monte H., to Harlan Mfg. Co., Inc. Fluid fertilizer control apparatus. 3,905,523, Cl. 222-504.000.

Aigami, Koji; and Inamoto, Yoshiaki, to Kao Soap Co., Ltd. Adamantylamidines and processes for making them. 3,906,044, Cl. 260-564.00R.

Aime, Jacques: *See—*
Meriaux, Claude; and Aime, Jacques, 3,906,213.

Air Industrie: *See—*
Fabre, Pierre, 3,905,785.

Air Products and Chemicals, Inc.: *See—*
Drage, David J., 3,905,556.
Gateshill, Henry Charles; and Shepherd, Norris Wilfred, 3,905,555.
Krutzel, Lawrence, 3,906,135.

Airheart Products, Inc.: *See—*
Martins, Samuel J., 3,905,455.

Aisin Seiki Kabushiki Kaisha: *See—*
Fujita, Masatoshi, 3,905,624.
Fujita, Masatoshi, 3,905,627.
Kawata, Shoji, 3,905,441.

Akahane, Fumitake; Iwakawa, Tsunekiyo; Imai, Hideyo; Okazaki, Hiroshi; and Wada, Toshio, to Nippon Electric Company Limited. Hot-cathode indicator tube for displaying luminescent figures. 3,906,286, Cl. 313-496.000.

Akashi, Mitsumasa: *See—*
Nakazawa, Hideaki; Iikuni, Tetsuo; and Akashi, Mitsumasa, 3,905,932.

Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, to Sumitomo Chemical Company Limited. Benzodiazepine derivatives and preparation thereof. 3,906,003, Cl. 260-239.30D.

Akgulian, Sahag C.; Haffner, Donald G.; and Meyer, Dean A., to Jacobsen Manufacturing Company. Torsion spring counterbalance for a lawn mower. 3,905,180, Cl. 56-7.000.

Aktieselskabet Brodrene Hartmann: *See—*
Moller, Bent, 3,905,542.

Alba-Waldensian, Incorporated: *See—*
Bounous, Daniel Barthlemy; and Lambert, Earl Abee, 3,905,212.

Albany International Corporation: *See—*
Jorgensen, Gary D., 3,905,786.

Albert, Kenneth J.; and Rice, James Sloan. Drinking receptacle cover and lip operated valve. 3,905,512, Cl. 220-90.400.

Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic ketones of dibenzofuran. 3,906,007, Cl. 260-346.20M.

Albright, Alva Z. Replaceable liners for saw bar grooves. 3,905,104, Cl. 30-384.000.

Alcan Research and Development Limited: *See—*
Gnyra, Bohdan, 3,906,084.

Alexander, Ernest John; and Mooradian, Aram, to Sterling Drug Inc. 1,2,3,4 Tetrahydrocarbazole-3-carboxylic and 4-carboxylic acids. 3,905,998, Cl. 260-315.000.

Alfarnes, Otto; and Hauknes, Knut, to A/S Ardal og Sunndal Verk. Crust-breakers. 3,905,647, Cl. 299-70.000.

Alfred Herbert Limited: *See—*
Smith, Ian W., 3,906,324.

Allemann, James G., to Aerojet-General Corporation. Two-stage, pressure augmented inflator assembly. 3,905,515, Cl. 222-3.000.

Allen, James R.: *See—*
Karchak, Andrew, Jr.; and Allen, James R., 3,905,436.

Allen, William P., Jr., to Lockheed Aircraft Corporation. Combination glideslope/localizer antenna for aircraft. 3,906,507, Cl. 343-705.000.

Allied Chemical Corporation: *See—*
Boggs, Beryl Aaron; Cooksey, James Judson; Newell, Harry Lee, Jr.; and Showers, John Walter, 3,905,075.

Alliger, Howard. Gas cleaner. 3,905,788, Cl. 55-489.000.

Allis-Chalmers Corporation: *See—*
Roberts, George W., 3,905,116.

Alsin Seiki Co., Ltd.: *See—*
Torii, Tatsumi; and Miyajima, Haruo, 3,905,456.

Alspach, Howard E. Bridge icing deterrent. 3,906,067, Cl. 264-46.500.

Alto Company: *See—*
Babik, Peter P., 3,905,467.

Alza Corporation: *See—*
Zaffaroni, Alejandro, 3,905,360.

Amano, Hisao: *See—*
Watanabe, Atsumi; Amano, Hisao; and Isono, Akira, 3,906,335.

Amason, Myron P.; and Kung, Joseph T., to McDonnell Douglas Corporation. Aircraft lightning protection system. 3,906,308, Cl. 317-2.00E.

American Can Company: *See—*
Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased, 3,905,854.
Kaiser, Edward William; and Rentmeester, Kenneth Richard, 3,906,126.
Ziegert, Richard Melvin, 3,905,931.

American Cyanamid Company: *See—*
Anderson, Robert Frederick; and Terzic, Bojan, 3,905,927.
Fanshawe, William Joseph; and Safir, Sidney Robert, 3,906,097.
Forgione, Peter Salvatore, 3,905,872.
Tomcuecik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, 3,905,974.

American Flange & Manufacturing Co., Inc.: *See—*
La Rocque, John W., 3,905,091.

American Forest Products Corporation: *See—*
Peterson, Dale S.; Vartikian, Onick M.; and Fieri, Anthony J., 3,905,478.

American Petroscience Corporation: *See—*
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,906,434.
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,906,435.

American Shoe Machinery Corporation: *See—*
Peterson, Raymond L.; and Garritt, Robert H., Jr., 3,905,265.

American Standard, Inc.: *See*—
Haas, Thomas W.; Mach, Richard L.; Studley, Edward; and Hoffman, Robert, 3,906,072.

American Sterilizer Company: *See*—
Winter, Roy Paul, 3,905,374.

AMF Incorporated: *See*—
Runshang, Anthony A., 3,906,357.

AMP Incorporated: *See*—
Lynch, James Edward; Parmer, Kenneth Ronald; and Cobaugh, Robert Franklin, 3,905,665.
Pritulsky, James; Reynolds, Charles Edward; and Wise, Joseph Agusta, 3,905,475.

Analog Devices, Incorporated: *See*—
Phillips, Berry W., 3,906,486.

Anchor/Darling Valve Company: *See*—
Karpenko, Anatole N., 3,905,577.

Andelfinger, Claus; Dommaschk, Walter; Ott, Werner; Ulrich, Manfred; and Weber, German, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Electron beam producing system for very high acceleration voltages and beam powers. 3,906,280, Cl. 313-449.000.

Andersen, Poul H.; and Klacza, Robert E., to Chrysler Corporation. Vehicle safety belt warning circuit. 3,906,441, Cl. 340-52.00E.

Andersen, Stephen Verner; and Swick, Edwin Grant, to Illinois Tool Works Inc. Integral multifinger contact and method of making. 3,905,318, Cl. 113-119.000.

Anderson, Clifford W.; Castrodale, Daniel O.; and Martin, Jerry T., to International Business Machines Corporation. Printing system. 3,906,141, Cl. 428-411.000.

Anderson, Edwin R. Jet engine intake protection system. 3,905,566, Cl. 244-53.00B.

Anderson, Ehnerd H.: *See*—
Gleason, David I.; and Anderson, Ehnerd H., 3,905,244.

Anderson, John R.; and Boros, Steve, to General Electric Company. Method of manufacturing miniature lamps. 3,905,078, Cl. 29-25.130.

Anderson, Lyle K., to Bioproducts Incorporated. Extraction of carotenoid pigment from shrimp processing waste. 3,906,112, Cl. 426-1.000.

Anderson, Perry W.: *See*—
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,906,114.

Anderson, Peter Holden: *See*—
Gooding, Dennis Jay; and Anderson, Peter Holden, 3,906,400.

Anderson, Richard N., to V. E. Anderson Manufacturing Company. Building structure. 3,905,154, Cl. 49-485.000.

Anderson, Robert Frederick; and Terzic, Bojan, to American Cyanamid Company. Dustless free-flowing lead stabilizer compositions for polyvinyl chloride. 3,905,927, Cl. 260-23.0XA.

Ando, Noriyoshi: *See*—
Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, 3,906,205.

Andre, Pierre; Duole, Claude; and Stadnikoff, Wladimir, to Commissariat a l'Energie Atomique. Method and device for automatic correction of harmonic distortion. 3,906,383, Cl. 328-163.000.

Anhalt, John W.; and Curley, James H., to International Telephone and Telegraph Corporation. Actuated printed circuit connector. 3,905,670, Cl. 339-75.0MP.

Anhalt, John W.; Goodman, David S.; and Burns, Edgar, to International Telephone and Telegraph Corporation. Sealed electrical connector. 3,905,672, Cl. 339-103.00R.

Anichini, Cesare, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Mechanical-electrical transducer gauge provided with a circuit for making linear the response of the gauge. 3,906,470, Cl. 340-195.000.

Anna Welding Corporation: *See*—
Berghof, Ernest H., 3,905,234.

Anzai, Shiro: *See*—
Iseda, Yutaka; Kitayama, Motozumi; Odaka, Fumio; and Anzai, Shiro, 3,905,945.

Aoki, Matsutarou: *See*—
Numazu, Ichiro; Okutsu, Yasuhiro; and Aoki, Matsutarou, 3,905,068.

Aonuma, Masashi: *See*—
Tadokoro, Eiichi; and Aonuma, Masashi, 3,905,779.

Apostolov, Kostadin Dimitrov: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Apps, David John, to International Telephone and Telegraph Corporation. Radio beacon enclosure. 3,906,370, Cl. 325-114.000.

Aptt, Harry W., Jr., to International Telephone and Telegraph Corporation. Ceramic cup electrode for a gas discharge device. 3,906,271, Cl. 313-213.000.

Aqua-Chem, Inc.: *See*—
Wang, Donald G. J., 3,905,886.

Arakawa, Nobuyuki: *See*—
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.

Arato, George, to Raymond Lee Organization, Inc., The. Oil transporting device. 3,905,410, Cl. 150-1.000.

Archibald, John Leheup, to John Wyeth & Brother Limited. Thiazole penicillins. 3,905,961, Cl. 260-239.100.

Argue, Gary R.: *See*—
Silver, H. Graham; Gardner, Phillip J.; Heller, Adam; and Argue, Gary R., 3,906,274.

Aries Electronics, Inc.: *See*—
Crimmins, David J.; and Sinclair, William Y., 3,905,667.

Armco Steel Corporation: *See*—
Cruse, Clyde L., Jr.; and Kerschbaum, Arthur P., 3,905,806.
Jasper, Joseph C.; and Pierson, Marvin B., 3,905,780.

Arnold, John Spencer: *See*—
Philip, Alexander Schroder; and Arnold, John Spencer, 3,906,164.

Arthur D. Little, Inc.: *See*—
Fowler, John T., 3,906,483.
Iannazzi, Fred D.; Rafferty, John W.; Sparrow, Donald B.; and Strauss, Richard, 3,906,064.

Arthur Guinness Son and Company (Park Royal) Limited: *See*—
Raynes, Stephen Henry, 3,905,433.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Tsurumi, Takashi; Emori, Shuichi; Daigoh, Kiyokazu; Ikegami, Takemi; and Kaneko, Tutomu, 3,906,130.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ishii, Haruo; Urano, Fumio; Kawasaki, Masahiro; and Mochizuki, Toshio, 3,906,531.
Mita, Kunio, 3,906,533.
Nomura, Katsuhiko; Urano, Fumio; and Kurei, Hiroshi, 3,906,517.

Asai, Osamu: *See*—
Hanazono, Masanobu; and Asai, Osamu, 3,905,883.

Asano, Yasuhisa: *See*—
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.

Ash, Eric Albert, to International Business Machines Corporation. Grating guides for acoustic surface waves. 3,906,432, Cl. 340-15.000.

Ashizawa, Yoshimi, to Toshiba Kikai Kabushiki Kaisha. Machine tools. 3,905,158, Cl. 51-89.000.

Ashland Oil, Inc.: *See*—
Gardikes, John J., 3,905,934.
Patel, Arvind C., 3,905,221.

Ashton, Norman Coupe, to N. C. Ashton Limited. Article formed of an aluminium bronze. 3,905,810, Cl. 75-154.000.

Aske, Leonard E. Miniature blowtorch. 3,905,755, Cl. 431-344.000.

Aspinwall, Peter. Book rough cutter with raker tooth. 3,905,531, Cl. 225-3.000.

Astier, Paul Georges; and Canaby, Pierre, to Etat Francais. Electrical push-button switch with photo-electrical switching elements. 3,906,222, Cl. 250-229.000.

Atlantic Richfield Company: *See*—
Schuh, Frank J., 3,905,319.

Attwood, Brian William: *See*—
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 3,905,864.

Audi Nsu Auto Union Aktiengesellschaft: *See*—
Ruf, Max, 3,905,730.

Audiometric Teleprocessing, Inc.: *See*—
Feezor, Michael D.; and Preslar, Mack J., 3,905,131.

Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of 1,5-and 1,8-dinitroanthraquinone. 3,906,011, Cl. 260-369.000.

Automobiles Peugeot: *See*—
Rivere, Jean-Pierre; Bertuol, Bernard; and Leichle, Claude, 3,906,207.

Autotrol Corporation: *See*—
Torpey, Wilbur N., 3,905,899.

Au-Yang, William M. Thyristor latching switch. 3,906,334, Cl. 323-21.000.

Avance Oil & Gas Company, Inc.: *See*—
Davis, J. Lee, 3,906,433.

Avco Corporation: *See*—
Matto, Lawrence R., 3,905,191.

Ayers, Peter G., to Procter & Gamble Company, The. Process for forming absorbent paper by imprinting a semi-twill fabric knuckle pattern thereon prior to final drying and paper thereof. 3,905,863, Cl. 162-113.000.

Ayme de la Chevreliere, Charles. Automatic soil-sprinkling arrangements. 3,905,551, Cl. 239-63.000.

Aziende Colori Nazionali Affini ACNA S.p.A.: *See*—
Gaetani, Ermanno; and Massabo, Vincenzo, 3,905,825.

Babik, Peter P., to Alto Company. Article aligning apparatus. 3,905,467, Cl. 198-30.000.

Bader, Christian, to Deutsche Automobilgesellschaft mbH, Firma. Method of measuring the charge condition of galvanic energy sources and apparatus for carrying out this method. 3,906,329, Cl. 320-44.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, 3,905,946.
Zeeh, Bernd; Jung, Johann; Rentzea, Costin; and Koenig, Karl-Heinz, 3,905,798.

Bagley, Rodney D., to Corning Glass Works. Extrusion apparatus for forming thin-walled honeycomb structures. 3,905,743, Cl. 425-464.000.

Bagley, Wallace E.: *See*—
Carroll, Wallace E.; and Jackson, Richard D., 3,905,769.

Bailey, Raymond E.: *See*—
DuPree, Donald G.; Bailey, Raymond E.; and Ling, Chester H. K., 3,905,400.

Bailey, Roger P.: *See—*
Magee, Donald L.; Bailey, Walter A.; and Bailey, Roger P., 3,905,856.

Bailey, Walter A.: *See—*
Magee, Donald L.; Bailey, Walter A.; and Bailey, Roger P., 3,905,856.

Bailleux, Michel, to Le Nickel. Method for producing high-purity nickel from sulphidized concentrates. 3,905,881, Cl. 204-113.000.

Baker, Kenneth Vincent, to Rockwell International Corporation. Improved rotary cutting die. 3,905,283, Cl. 93-58.20R.

Baker, Richard H., to Massachusetts Institute of Technology. Apparatus wherein a segmented fluid stream performs electrical switching functions and the like. 3,906,415, Cl. 335-47.000.

Baker, Thaddeous J. Constant current powered telephone circuits. 3,906,167, Cl. 179-81.00R.

Bakewell, Joseph J., to Dynamics Research Corporation. Method of manufacturing a thin encoder disc. 3,905,817, Cl. 96-36.000.

Bakka, Raymond, to International Standard Electric Corporation. Wrong addressing detector. 3,906,209, Cl. 235-153.0AM.

Baldoni, Vittorio. Rotating current tap and process for obtaining same. 3,905,664, Cl. 339-8.00R.

Balducci, Agostino: *See—*
Corbellini, Margherita; and Balducci, Agostino, 3,905,913.

Ballew, James S., to Omark Industries, Inc. File guide. 3,905,118, Cl. 33-202.000.

Ballog, George M. Tennis racket hand grip. 3,905,598, Cl. 273-75.000.

Banholzer, Rolf: *See—*
Sirrenberg, Walter; Bauer, Rudolf; Schulz, Werner; and Banholzer, Rolf, 3,905,957.

Barber, Anthony Clifford, to Imperial Metal Industries (Kynoch) Limited. Electrolytic processes and electrodes therefor. 3,905,828, Cl. 136-6.00R.

Barber, Gerald L. Trailer mounted collapsible roundabout. 3,905,596, Cl. 272-29.000.

Bard, Allen J.; and Keszthelyi, Csaba Peter, to Bell-Northern Research Ltd. Electrochemical luminescent solutions and devices incorporating such solutions. 3,906,283, Cl. 313-483.000.

Barensfeld, Lothar: *See—*
Callahan, George Edgar; and Barensfeld, Lothar, 3,905,366.

Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., to Eastman Kodak Company. Polyester film base having uniform high optical density. 3,905,938, Cl. 260-40.00R.

Barlow, Charles Brian; White, Brian Graham; and Tomlin, Clive Dudley Spencer, to Imperial Chemical Industries Limited. Certain pyrimidine compounds useful against plant pests. 3,906,098, Cl. 424-251.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Bauer, Karl; and Streppel, Herbert, 3,905,185.

Barnes, Eugene H.: *See—*
Hoeschele, David F., Jr.; and Barnes, Eugene H., 3,906,172.

Barr, Charles; and Urquhart, George B., to Textron, Inc. Rocket propelled incendiary bomb. 3,905,297, Cl. 102-66.000.

Barraco, Anthony J.; and Rockwell, Albert M., Jr., to Barraco, Anthony J. Indirectly heated cathode-heater assembly and support means therefor. 3,906,276, Cl. 313-337.000.

Barrett, Harrison H.: *See—*
DeMeester, Gordon D.; Barrett, Harrison H.; and Wilson, David T., 3,906,229.

Barrie, Ian Torrance, to Imperial Chemical Industries Limited. Injection moulding process. 3,906,066, Cl. 264-45.500.

Barrus, Gordon Brent; Emenaker, Leo Joseph; and Melissa, Raymond Franklin, to Pertec Corporation. High speed line printing apparatus. 3,905,294, Cl. 101-93.480.

Barry Wright Corporation: *See—*
Dean, Carl J.; Wright, David M.; and Cournoyer, Bernard T., 3,905,484.

Basch, Harold I.: *See—*
Lee, Bong Kuk; Ryu, Dewey D. Y.; Miraglia, Gennaro John; Basch, Harold I.; and Mukherjee, Barid B., 3,905,955.

BASF Aktiengesellschaft: *See—*
Schuhmacher, Alfred; and Schwantje, Gerd, 3,906,012.
Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, 3,905,420.

Bass, Larry F., to Rockwell International Corporation. Synchronous differentially coherent PSK demodulation. 3,906,376, Cl. 329-104.000.

Batchelor, John Frederick: *See—*
Hodson, Harold F.; and Batchelor, John Frederick, 3,905,989.

Batey, Peter Harvey: *See—*
Horton, Laurence Henry; and Batey, Peter Harvey, 3,906,278.

Bauer, Heinz, to Bauer-Kompressoren, Hans Bauer. Rotary piston. 3,905,729, Cl. 418-84.000.

Bauer, Henry, to Days-Ease Home Products Corporation. Phytotoxic drain cleaner. 3,905,909, Cl. 252-156.000.

Bauer, Karl; and Streppel, Herbert, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Apparatus for applying threads on heating systems of textile machines. 3,905,185, Cl. 57-106.000.

Bauer-Kompressoren, Hans Bauer: *See—*
Bauer, Heinz, 3,905,729.

Bauer, Peter, to Rohm GmbH. Laminate having a compressed foam core. 3,906,137, Cl. 428-315.000.

Bauer, Rudolf: *See—*
Sirrenberg, Walter; Bauer, Rudolf; Schulz, Werner; and Banholzer, Rolf, 3,905,957.

Bayer Aktiengesellschaft: *See—*
Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 3,906,011.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,905,970.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,905,983.
Buchel, Karl Heinz; and Hammann, Ingeborg, 3,906,023.
Hendricks, Udo-Winfried; and Walz, Klaus, 3,906,063.
Kronig, Walter; and Schwerdtel, Wulf, 3,905,875.
Kutzbach, Carl; and Schmidt-Kastner, Gunther, 3,905,870.
Meussdoerffer, Johann Nikolaus; Niederprum, Hans; and Dahm, Manfred, 3,906,027.
Noll, Klaus, 3,905,929.
Reubke, Karl-Julius; Hohmann, Walter; and Bien, Hans-Samuel, 3,906,013.
Schade, Franz; and Nebeling, Reinhard, 3,906,037.

Baylor College of Medicine: *See—*
Decker, Thomas A.; Kuether, Christian L.; Williams, Robert E.; and Logar, Noel D., 3,905,688.

Beal, Daniel W.: *See—*
Parenti, Edmund K., Jr.; Bloomfield, David P.; Grevstad, Paul E.; and Beal, Daniel W., 3,905,884.

Bear Manufacturing Corporation: *See—*
Butler, Louis L., 3,905,120.

Bearings, Seals, & Gears, Inc.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Billings, David R., 3,905,710.

Beatrice Foods Co.: *See—*
Lovejoy, Walter R., 3,905,740.
Nagel, Robert I., 3,905,680.
Nagel, Robert I., 3,905,681.

Beatrice Foods Company Div. Elgin Molded Plastics: *See—*
Lindner, Henry; and Kennedy, James D., 3,905,677.

Beaudoin, Roger: *See—*
Leblanc, Leopold, 3,906,143.

Becker, Joseph T. Launcher for toy vehicle having variable force means. 3,905,350, Cl. 124-17.000.

Beckman Instruments, Inc.: *See—*
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., 3,906,513.

Beckmann, Robert M.; Lamb, James A.; Nieglos, Donald J.; and Reynolds, Gary R., to Motorola, Inc. Alphanumeric terminal for a communications system. 3,906,445, Cl. 340-146.1BA.

Becton, Dickinson and Company: *See—*
Shepherd, John W., 3,905,101.

Beech Aircraft Corporation: *See—*
Hibl, Joseph J.; and Sutton, Harold E., 3,905,508.

Beecham, Inc.: *See—*
Clark, Dennis E.; and Kerr, William J., 3,905,960.

Beehive Machinery Inc.: *See—*
McFarland, Archie Rae, 3,906,118.

Beetle, Arthur B., to TRW Inc. Method of making plural potentiometer body. 3,905,097, Cl. 29-620.000.

Behn, Sheldon P., to Super Laundry Machinery Company, Inc. Flatwork folding system. 3,905,593, Cl. 270-62.000.

Belknap, Raymond R.: *See—*
Guebert, Gerald E.; and Belknap, Raymond R., 3,905,414.

Bell, George Richard: *See—*
Coombs, Garth; Butterworth, Elbert Roy; and Bell, George Richard, 3,905,910.

Bell & Howell Company: *See—*
Filipovich, Danny, 3,906,529.

Bell, Jonathan Durand, to Black and Decker Manufacturing Company, The. Convertible liquid spray nozzle. 3,905,554, Cl. 239-424.000.

Bell-Northern Research Ltd.: *See—*
Bard, Allen J.; and Keszthelyi, Csaba Peter, 3,906,283.

Bell, Sterling W. Ski lock. 3,905,214, Cl. 70-58.000.

Bell Telephone Laboratories, Incorporated: *See—*
Dienes, Andrew; Shank, Charles Vernon; and Trozzolo, Anthony Marion, 3,906,399.
Glaser, Arthur Barry, 3,906,211.
Hamilton, Billy Harold; Kunzinger, Frederick Francis; and La Porta, Frank Carl, 3,906,331.
Joel, Amos Edward, Jr., 3,906,175.
Kieburtz, Robert Bruce; and Mina, Kent Vincent, 3,906,199.
Krambeck, Robert Harold; Smith, George Elwood; and Strain, Robert Joseph, 3,906,542.
Martin, Robert Lanham, 3,906,454.
McEowen, James Royce, 3,906,168.
Seidel, Harold, 3,906,401.
Smith, George Elwood; and Vratny, Frederick, 3,906,543.

Belloc, Andre; Florent, Jean; Mancy, Denise; and Verrier, Jean, to Rhone-Poulenc S.A. New amylase and its preparation by fermentation of a penicillium. 3,906,113, Cl. 426-64.000.

Beloit Corporation: *See—*
Blair, Eugene R., 3,905,734.
Bringman, David J., 3,905,736.
McCarty, David W., 3,905,742.

Bemiss-Jason Corporation: *See—*
Eberly, Charles E., 3,905,532.

Ben-Gurion University of the Negev Research & Development Authority: *See—*
Loeb, Sidney, 3,906,250.

Bendeberica S.A.: *See—*
Rosell, Jorge Estela, 3,905,277.

Bendix Corporation, The: *See—*
Kozlowski, Joseph M., 3,906,273.

Mortensen, Harold R., 3,905,245.
Taylor, Robert A.; and Brandao, Ruy L., 3,906,494.
Bengel, Thomas G.; Sallo, Richard L.; and Stricker, Charles D., to United States Steel Corporation. Method for the electrolytic conditioning of metal tubes. 3,905,885, Cl. 204-129.430.
Bennett, Allan I., to Westinghouse Electric Corporation. Integrator circuit and low frequency two phase oscillator incorporating same. 3,906,381, Cl. 328-128.000.
Bennett, Paul I.: *See—*
Doerksen, David P.; and Bennett, Paul I., 3,905,269.
Bensussan, Andre: *See—*
Levaillant, Claude; and Bensussan, Andre, 3,906,407.
Bentkowski, L. E.: *See—*
Goza, Alva L.; Smith, Fay D.; Bentkowski, L. E.; Evans, Donald W.; Blake, Ronald P.; and Thompson, Jimmie L., 3,905,050.
Benz, Mark C., to General Electric Company. Sintered cobalt-rare earth intermetallic product. 3,905,840, Cl. 148-31.570.
Benz, Mark G., to General Electric Company. Liquid sintered cobalt-rare earth intermetallic product. 3,905,839, Cl. 148-31.570.
Berger, Alfred H. Battery powered hand tool. 3,905,429, Cl. 173-163.000.
Berger, Gerald B.: *See—*
Hoeschele, David F., Jr.; and Berger, Gerald B., 3,906,367.
Berger, James E. Gas proportioner means and method. 3,905,384, Cl. 137-111.000.
Berges, David A., to SmithKline Corporation. Method for O-acylating 7-acylamino-cephalosporadesic acids. 3,905,967, Cl. 260-243.00C.
Bergeson, Richard P., to Maytag Company, The. Convertible dishwasher. 3,905,663, Cl. 312-253.000.
Berghof, Ernest H., to Anna Welding Corporation. Underwater welding test chamber. 3,905,234, Cl. 73-432.0SD.
Berilla, Thomas; Long, James B.; and Martin, Clyde D. True dimensioning and tolerancing demonstrator. 3,905,129, Cl. 35-13.000.
Berliner Maschinenbau-AG vormals L. Schwartzkopff: *See—*
Claussen, Lorenz, 3,905,536.
Berndt, Walter; and Lauff, Helmut F., to C. Keller & Co. Stacking of bricks. 3,905,489, Cl. 214-6.00A.
Bernstrom, Elon C. Electrical razor. 3,905,099, Cl. 30-41.500.
Berrie, Alistair Howard; and Hughes, Nigel, to Imperial Chemical Industries Limited. Azo dyestuffs containing a 1-lower alkyl-6-hydroxypyrid-2-one coupling component. 3,905,951, Cl. 260-156.000.
Berta, Dominic A., to United States of America, Navy. Composite modified double base propellant with metal oxide stabilizer. 3,905,846, Cl. 149-19.400.
Bertolasi, Robert B., to Kelsey-Hayes Company. Electro optical meter system having a series lighting display and matrix scanning. 3,906,345, Cl. 324-166.000.
Bertuol, Bernard: *See—*
Rivere, Jean-Pierre; Bertuol, Bernard; and Leichle, Claude, 3,906,207.
Betz, Hans; Merz, Dietrich; Winter, Heinrich; and Ahlborn, Hans. Process of manufacturing aluminum-lead bearing material. 3,905,083, Cl. 29-149.50S.
Bezdek, Miloslav: *See—*
Jansa, Milos; Bezdek, Miloslav; and Spisiak, Juraj, 3,905,402.
Bianchi, Paolo; Ramacciotti, Aldo; and Repetto, Eugenio, to Centro Sperimentale Metallurgico S.p.A. Process for producing ingots by electric resistance melting particulate metal under slag. 3,905,803, Cl. 75-10.00C.
Bielesch, Helene: *See—*
Bielesch, John; and Bielesch, Helene, 3,905,295.
Bielesch, John; and Bielesch, Helene. Roller printer. 3,905,295, Cl. 101-331.000.
Bien, Hans-Samuel: *See—*
Reubke, Karl-Julius; Hohmann, Walter; and Bien, Hans-Samuel, 3,906,013.
Bienert, Horst, to Webasto-Werk W. Baier KG. Level adjusting device for sliding roofs. 3,905,641, Cl. 296-137.00F.
Biland, Hans Rudolf; Duennenberger, Max; and Luethi, Christian, to Ciba-Geigy A.G. Oxalic acid diarylamides. 3,906,033, Cl. 260-479.00R.
Billings, Charles A.: *See—*
Holdsworth, Robert S.; Billings, Charles A.; and O'Neill, Gerald J., 3,906,052.
Billings, Charles Alden; O'Neill, Gerald Joseph; and Simons, Charles William, to W. R. Grace & Co. Halogenated methylcyclopropyl ethers for inducing a state of anesthesia. 3,906,111, Cl. 424-342.000.
Billings, David R.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Billings, David R., 3,905,710.
Billottet, Henri: *See—*
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, 3,906,492.
Bioproducts Incorporated: *See—*
Anderson, Lyle K., 3,906,112.
Bird Electronic Corporation: *See—*
Lesyk, Leo, 3,906,402.
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and device for the wet treatment and drying of textile material. 3,905,764, Cl. 8-140.000.
Bischeltsrieder, Lorenz, to Stubben GmbH, Riding Equipment. Stirrup. 3,905,179, Cl. 54-47.000.
Bissinger, Norbert, to International Standard Electric Corporation. Adjustable deflection unit for television picture tubes. 3,906,419, Cl. 335-210.000.
Bissitt, Ian Stockwell, to Wira and Mather & Platt, Ltd. Steam treatment of fabrics. 3,905,765, Cl. 8-149.300.
Black, Arthur Lowell, to Ingersoll-Rand Company. Tie bolt sealing means. 3,905,713, Cl. 403-405.000.
Black and Decker Manufacturing Company, The: *See—*
Bell, Jonathan Durand, 3,905,554.
Cowman, George Wilbur, 3,906,266.
Black, William Raymond, to Borden, Inc. Urea-aldehyde resin adhesives and process. 3,905,847, Cl. 156-62.200.
Blackburn, Jack. Method of laying wooden floors. 3,905,172, Cl. 52-741.000.
Blaha, Franklyn C.; and Oehler, Harry G., to Westinghouse Electric Corporation. Magnetic field sensing CCD device with a slower output sampling rate than the transfer rate yielding an integration. 3,906,359, Cl. 324-43.00R.
Blair, Eugene R., to Beloit Corporation. Continuous tube forming by melt blowing technique. 3,905,734, Cl. 425-224.000.
Blair, Reed F., to Reed F. Blair, Incorporated. Patient lift and support for hospital bed. 3,905,055, Cl. 5-85.000.
Blake, Ronald P.: *See—*
Goza, Alva L.; Smith, Fay D.; Bentkowski, L. E.; Evans, Donald W.; Blake, Ronald P.; and Thompson, Jimmie L., 3,905,050.
Bland, John, to Sir Robert McAlpine & Sons Limited. Tunnelling machines. 3,905,645, Cl. 299-31.000.
Blasy, Richard M.; and McDermott, Richard T. Cycle reflector. 3,905,678, Cl. 350-97.000.
Blau, Leslie: *See—*
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, 3,905,919.
Blewett, Donald A.; and Adams, Richard G., to Owens-Corning Fiberglas Corporation. Rigid fibrous panel and method of making same. 3,905,855, Cl. 156-323.000.
Bloomfield, David P.: *See—*
Parenti, Edmund K., Jr.; Bloomfield, David P.; Grevstad, Paul E.; and Beal, Daniel W., 3,905,884.
Blundell, Thomas: *See—*
Colchester, John Edward; and Blundell, Thomas, 3,905,986.
Blythe, Joseph A., Jr. Sail batten. 3,905,321, Cl. 114-103.000.
Boardman, Harold; and Wagner, Richard L., to Hercules Incorporated. Preparing lithographic plates utilizing hydrolyzable azoand azidosilane compounds. 3,905,816, Cl. 96-33.000.
Bodine Electric Company: *See—*
Zurad, Joseph T., 3,906,316.
Boe, Hans, to Carl Freudenberg, Firma. Chamois leather-like material having improved water absorbency and abrasion resistance. 3,906,131, Cl. 428-151.000.
Boehringer Ingelheim GmbH: *See—*
Sirrenberg, Walter; Bauer, Rudolf; Schulz, Werner; and Banholzer, Rolf, 3,905,957.
Boeing Computer Services, Inc.: *See—*
Houston, George B.; and Simonsen, Roger H., 3,906,455.
Boesten, Wilhelmus H. J.: *See—*
Dahlmans, Johannes J.; and Boesten, Wilhelmus H. J., 3,905,988.
Boggs, Beryl Aaron; Cooksey, James Judson; Newell, Harry Lee, Jr.; and Showers, John Walter, to Allied Chemical Corporation. Noise reduction and heat zone separation system. 3,905,075, Cl. 28-1.400.
Boillot, Pierre, to Institut de Recherches de la Siderurgie Francaise. Quantitative gas detection apparatus. 3,905,222, Cl. 73-19.000.
Boissel, Pierre: *See—*
Guernet, Jacques; and Boissel, Pierre, 3,906,225.
Bok, Edward. Pen with injection system. 3,905,709, Cl. 401-183.000.
Boldov, Valentin Ivanovich: *See—*
Vlasov, Pavel Semenovich; Ivanov, Alexandr Karlovich; Svechnikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich, 3,905,546.
Bolldorf, Kurt; and Busch, Edgar, to Pfaff Industriemaschinen GmbH. Thread cutting device in embroidering machines. 3,905,314, Cl. 112-83.000.
Boller, George E.: *See—*
Renk, Richard J.; and Boller, George E., 3,905,659.
Bollet, Ronald E.: *See—*
Osenbaugh, Carl D.; and Bollet, Ronald E., 3,905,089.
Bolt Beranek and Newman Inc.: *See—*
Scharton, Terry D., 3,905,445.
Bomboire, Rene F., to Eurofloor S.A. Textured sheet material and method of preparation thereof. 3,905,849, Cl. 156-79.000.
Bond, Herbert M., to Buckbee-Mears Company. Abrading devices. 3,905,080, Cl. 29-76.00R.
Bondon, Raymond: *See—*
Stokes, John H.; and Bondon, Raymond, 3,905,049.
Boner, Charles R.; and Boner, Richard E. Method and apparatus for tailoring the house curve of a sound system. 3,906,157, Cl. 179-1.0AT.
Boner, Richard E.: *See—*
Boner, Charles R.; and Boner, Richard E., 3,906,157.
Bonham, James A., to Minnesota Mining and Manufacturing Company. Photopolymerizable sheet material with diazo resin layer. 3,905,815, Cl. 96-68.000.
Bonnie, G. Patrick: *See—*
Velishek, Francis P.; and Bonnie, G. Patrick, 3,906,467.
Bontempi, Jules. Hair curler. 3,905,380, Cl. 132-40.000.
Booher, Richard N., to Eli Lilly and Company. M-dioxane-5-methylamine analgesics. 3,905,987, Cl. 260-296.00R.
Borden, Inc.: *See—*
Black, William Raymond, 3,905,847.

Borg-Warner Corporation: *See*—
Boyer, Nicodemus E., 3,906,061.

Boros, Steve: *See*—
Anderson, John R.; and Boros, Steve, 3,905,078.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine carboxylic acid esters. 3,905,970, Cl. 260-247.20B.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 3,5,6-Tricarboxy- and 2,3,5,6-tetracarboxy-1,4-dihydropyridine derivatives. 3,905,983, Cl. 260-294.80G.

Botcharoff, Jacqueline N. Ozone generating device. 3,905,920, Cl. 250-536.000.

Bounous, Daniel Barthlemy; and Lambert, Earl Abee, to Alba-Waldensian, Incorporated. Inspection toe for anti-embolism stocking. 3,905,212, Cl. 66-185.000.

Bourdamis, George M. Wire projectile receiving frame. 3,905,600, Cl. 273-96.00R.

Bourges, Bernard M., to Societe Anonyme: Poclain. Public works machine having a safety device for the manoeuvre of its working equipment. 3,905,500, Cl. 214-762.000.

Bourns, Inc.: *See*—
Frey, Sydney W., Jr.; and Gaines, Robert W., 3,906,428.

Boyce, James J.; Di Giugno, Angelo J.; and Masi, James V., to Bunker Ramo Corporation, The. Control element for electrical reading or recording device. 3,905,463, Cl. 197-1.00R.

Boyd, Harry R.: *See*—
Jackson, Harry L.; and Boyd, Harry R., 3,905,896.

Boyer, Nicodemus E., to Borg-Warner Corporation. Halogen containing phosphorus monools. 3,906,061, Cl. 260-928.000.

Boyesen, Eyvind, to Performance Industries, Inc. Engine valving and porting. 3,905,340, Cl. 123-73.00A.

Boyesen, Eyvind, to Performance Industries, Inc. Engine valve means and porting. 3,905,341, Cl. 123-73.00R.

Boyesen, Eyvind, to Performance Industries, Inc. Engine valve means and porting. 3,905,342, Cl. 123-73.0AA.

BPB Industries, Ltd.: *See*—
George, James Stanley, 3,906,083.

Braceley, Michael, to Rank Organisation Limited, The. Transducers. 3,906,171, Cl. 179-115.5VC.

Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, to Carling O'Keefe Limited. Packaging structure and blank for container cover. 3,905,646, Cl. 229-51.0TC.

Bradley, Earl H., to Worcester Pressed Aluminum Corporation. Collapsible saw. 3,905,409, Cl. 145-33.00E.

Bradley, Frank R. Telephone line characteristic measuring instrument and display. 3,906,173, Cl. 179-175.30R.

Bradley, William S.; Hardy, William C ; and Lea, James F., Jr., to Sun Oil Company (Delaware). Mist injection method and system. 3,905,553, Cl. 239-124.000.

Brandao, Ruy L.: *See*—
Taylor, Robert A.; and Brandao, Ruy L., 3,906,494.

Brandhorst, Willem, to Hazemeijer B.V. Current limiting device. 3,906,427, Cl. 338-38.000.

Brandiff, Ray: *See*—
Hudson, Harold G.; and Brandiff, Ray, 3,905,882.

Brandt, Edison R., to Polaroid Corporation. Remote control system for photographic apparatus. 3,906,244, Cl. 307-115.000.

Brandwein, Rowland; and Gupta, Mohan, to Textron, Inc. Device for monitoring the operating parameters of a dynamic system. 3,906,437, Cl. 340-27.000.

Branson, Charles D., to Robertshaw Controls Company. Fuel control system and method of operating the same. 3,905,747, Cl. 431-58.000.

Brasier, Jean, to Thomson-CSF. Airborne altitude indicator device. 3,906,497, Cl. 343-12.00A.

Brauer, Robert C., to O'Brien & Brauer Construction, Inc. Concrete forming system. 3,905,574, Cl. 249-45.000.

Breckenfelder, Alvin Herman, to Illinois Tool Works Inc. Construction and method for forming a plunger seal. 3,905,246, Cl. 74-18.200.

Brenski, Edwin F.; Draayer, Jan; Reynolds, Nigel J. E.; and Risky, Frank A., to GTE Automatic Electric Laboratories Incorporated. Peripheral control unit for a communication switching system. 3,906,163, Cl. 179-18.0ES.

Bresson, Clarence R.; and Cobb, Raymond L., to Phillips Petroleum Company. Multifunctional hydroxy compounds. 3,906,042, Cl. 260-559.00T.

Bridgestone Tire Company Limited: *See*—
Iseda, Yutaka; Kitayama, Motozumi; Odaka, Fumio; and Anzai, Shiro, 3,905,945.
Oyama, Hiroichi; Matsuki, Yoshinori; and Ohkawa, Fujio, 3,905,208.

Bringman, David J., to Beloit Corporation. Sheet web generation via a tubularly formed web. 3,905,736, Cl. 425-308.000.

British Chrome & Chemicals Limited: *See*—
Middleton, Robert; Timms, Peter Leslie; and Gibson, Geoffrey Moorhouse, 3,906,017.

Brockhaus, Ernst, to Ed. Scharwachter KG. Combined door stopper and hinge assembly. 3,905,064, Cl. 16-145.000.

Brodie, James H. Prefabricated building construction. 3,905,548, Cl. 237-69.000.

Brooks, Daryl G., to Porta-Tool, Incorporated. Boring machine. 3,905,717, Cl. 408-107.000.

Brooks, Harry F.: *See*—
Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., 3,905,809.

Brooks, Ralph J., to Klein, Andrew R., trustee. Impact absorbing system. 3,905,454, Cl. 188-1.00C.

Brooks, Walter G.; and Knodle, John P., to Production Operators, Inc. System for supplying inert gas. 3,905,773, Cl. 23-281.000.

Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, to Hoffmann-La Roche Inc. Preparation of 2,3,4,5-tetrahydro-1H-3-benzazepines and 1,2,3,4,5,6-hexahydro-3-benzazocines. 3,906,006, Cl. 260-340.500.

Brown, Allen C.: *See*—
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 3,905,362.

Brown, Boveri & Cie, AG: *See*—
Depenbrock, Manfred, 3,906,337.

Brown, Byron T.: *See*—
Griffin, Donald E.; Brown, Byron T.; and Williams, William H., 3,905,874.

Brown, Perry H.; and Tremblay, Maurice H., to Brunswick Corporation. Electrochemical electrodes. 3,905,831, Cl. 136-86.00D.

Browning-Ferris Industries, Inc.: *See*—
Cradeur, Robert R., 3,905,061.

Bruan, Eric A.: *See*—
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Bruan, Eric A.; and Walke, Earl W., Jr., 3,905,280.

Brudny, Joseph. System for the measurement, display and instrumental conditioning of electromyographic signals. 3,905,355, Cl. 128-2.10M.

Brumlik, George C., to Ingrip Fasteners, Inc. Press-through self-gripping device. 3,905,071, Cl. 24-204.000.

Brunberg, Karl Gunnar, to Telefonaktiebolaget L M Ericsson. Arrangement in contact-spring-sets. 3,905,590, Cl. 267-160.000.

Brundiek, Horst, to Loesche Hartzerkleinerungs -und Zementmachinen KG. Armoured ring for deflecting a dust-gas flow, in roller grinding mills. 3,905,559, Cl. 241-59.000.

Brunswick Corporation: *See*—
Brown, Perry H.; and Tremblay, Maurice H., 3,905,831.

Brunswick Mfg. Co., Inc.: *See*—
Hewson, John R.; and Hewson, Roy H., 3,905,361.

Bryan, Graham W.: *See*—
Noiles, Douglas G.; and Bryan, Graham W., 3,905,276.

Bryant, Robert G., to Gem Industries Inc. Safety catch for crib drop sides. 3,905,625, Cl. 292-128.000.

Bryers, Richard William: *See*—
Gamble, Robert L.; and Bryers, Richard William, 3,905,336.

Buchel, Karl Heinz; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Substituted-2-alkoxycarbonyloxy benzoic acid anilides. 3,906,023, Cl. 260-463.000.

Buckbee-Mears Company: *See*—
Bond, Herbert M., 3,905,080.

Bucourt, Robert; Pierdet, Andre; and Salmon, Jean, to Roussel-UCLAF. Novel 11β-alkoxy steroids. 3,906,096, Cl. 424-243.000.

Bucyrus-Erie Company: *See*—
Nelmark, Jack D.; and Smith, Matthew, 3,905,168.

Buddecke, Heinrich, to Officine Savio S.p.A. Method and apparatus for the finishing treatment of yarns. 3,905,074, Cl. 28-1.00R.

Buerger, Gert: *See*—
Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, 3,905,420.

Bugaut, Andree: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,905,761.

Bulk Unit Load Systems Limited: *See*—
Snape, George William, 3,905,389.

Bunes, Leonard A.: *See*—
Olofson, Roy A.; Schnur, Rodney C.; and Bunes, Leonard A., 3,905,981.

Bunker Ramo Corporation, The: *See*—
Boyce, James J.; Di Giugno, Angelo J.; and Masi, James V., 3,905,463.

Bunnell, Arthur K.: *See*—
Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, 3,905,646.

Burdet, Evelyne: *See*—
Hofer, Kurt; Moesch, Rudolf; Schilli, Alfred; and Burdet, Evelyne, 3,906,041.

Burling, Eric Douglas; and Steel, Margaret Lilian, to Imperial Chemical Industries Limited. Packaging with internal pile surfaces. 3,906,128, Cl. 428-86.000.

Burlington Industries, Inc.: *See*—
Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., 3,905,928.

Burns, Edgar: *See*—
Anhalt, John W.; Goodman, David S.; and Burns, Edgar, 3,905,672.

Burroughs Corporation: *See*—
Ehlers, Randall Gordon, 3,906,458.
Jeffree, Samuel J., 3,906,240.

Burroughs Wellcome Co.: *See*—
Hodson, Harold F.; and Batchelor, John Frederick, 3,905,989.

Busch, Edgar: *See*—
Bolldorf, Kurt; and Busch, Edgar, 3,905,314.

Busch, Heinrich: *See*—
Salamon, Klaus; Busch, Heinrich; and Zander, Eberhard, 3,906,330.

Busch, Lothar: *See*—
Franck, Gunter; and Busch, Lothar, 3,906,284.

Bush Boake Allen Ltd.: *See—*
Quesnel, Peter Gregory; Lambrou, Andreas; and Walker, Edwin Stanley, 3,906,116.

Busse, Floyd E.; and Theis, Leon J., to Wehr Corporation. Adjustable grille. 3,905,284, Cl. 98-110.000.

Butler Automatic, Inc.: *See—*
Meihofer, Edward F., 3,906,232.

Butler, Louis L., to Bear Manufacturing Corporation. Scuff gauge. 3,905,120, Cl. 33-203.140.

Butter, Stephen A.: *See—*
Kaeding, Warren W.; and Butter, Stephen A., 3,906,054.

Butterworth, Elbert Roy: *See—*
Coombs, Garth; Butterworth, Elbert Roy; and Bell, George Richard, 3,905,910.

Buttner, Rolf: *See—*
Rassbach, Felix; Buttner, Rolf; and Schuck, Stephan, 3,905,066.

Butulis, Arnis G., to Monarch Marking Systems, Inc. Data retrieval and error detection circuitry for a width-modulated bar-code scanning apparatus. 3,906,203, Cl. 235-61.11E.

Bzura, Hyman, to Madison Industries, Inc. Process for the recovery of metallics from brass skimmings. 3,905,808, Cl. 75-101.00R.

C.G.R.-Mev.: *See—*
Tran, Duc Tien, 3,906,300.

C J Wennberg AB: *See—*
Segerstrom, Kjell Erik Lennart, 3,905,468.

C. Keller & Co.: *See—*
Berndt, Walter; and Lauff, Helmut F., 3,905,489.

CAE Machinery Ltd.: *See—*
Weavell, Jack; and Porter, James H., 3,905,266.

Caelus Memories Inc.: *See—*
Chur, Sung Pal, 3,906,326.

Cain, Earl S.; Carlson, Jerome A.; and Billings, David R., to Bearings, Seals, & Gears, Inc. Shaft coupling having a keyway insert and method for forming the same. 3,905,710, Cl. 403-4.000.

Cairo, Anthony C.; and Holkeboer, Ronald E., to Robertshaw Controls Company. Primary control system for furnaces. 3,905,748, Cl. 431-78.000.

Cal-Turf, Inc.: *See—*
Grether, Tobias H. A., 3,905,313.

Callahan, Barbara H. Drinking glass sterilizer. 3,906,236, Cl. 250-455.000.

Callahan, George Edgar; and Barensfeld, Lothar. Injection syringe with shiftable comparison indicator. 3,905,366, Cl. 128-218.00C.

Calspan Corporation: *See—*
Romeo, David J., 3,905,613.

Calvet, Pierre; and Liousse, Francois, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Device for measurement by active sensor. 3,905,230, Cl. 73-204.000.

Calvet, Robert: *See—*
Moussou, Jean; and Calvet, Robert, 3,905,758.

Cambridge Research and Development Group: *See—*
Schiffman, Murray M., 3,906,384.

Campbell, Earle E.; and Fosnaugh, James E., to National Meter Parts. Gas meter part. 3,905,231, Cl. 73-267.000.

Campbell, Glenn M.; and Krassas, James G., to General Mills, Inc. Snack fryer. 3,905,285, Cl. 99-353.000.

Campbell, Gregory A.; Dearlove, Thomas J.; and Meluch, William C., to General Motors Corporation. Preparation of di(isocyanato-tolyl) urea. 3,906,019, Cl. 260-453.00P.

Canaby, Pierre: *See—*
Astier, Paul Georges; and Canaby, Pierre, 3,906,222.

Canadian Patents & Development Ltd.: *See—*
Capes, Charles E., 3,906,140.

Canon Kabushiki Kaisha: *See—*
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,905,697.
Matsumoto, Kazuya, 3,905,703.
Matsumoto, Seiichi; and Hosoe, Kazuya, 3,906,389.
Moriyama, Inao; Itani, Takashi; and Takahashi, Kiyoshi, 3,905,693.
Ogiso, Mitsutoshi; and Ohtaki, Shohei, 3,906,523.
Shirasaki, Takayuki, 3,906,534.

Canron, Inc.: *See—*
Stewart, John Kenneth, 3,905,300.

Cantrell, Ronald G., to Houdaille Industries, Inc. Lightweight, low cost impact resistant bumpers. 3,905,630, Cl. 293-98.000.

Capes, Charles E., to Canadian Patents & Development Ltd. Co-pelletizing salt mixtures. 3,906,140, Cl. 428-403.000.

Capital Machine Company, Inc.: *See—*
Hale, Thomas F., 3,905,408.

Cappon, Arthur M., to Sperry Rand Corporation. Integrated MNOS memory with decoder. 3,906,461, Cl. 340-172.500.

Cargill, Don A.; Corp, Paul M.; and Forster, Lloyd M. Building panels. 3,905,171, Cl. 52-615.000.

Carini, George Francis; Hommel, Ernest Mayer; and Twigger, James Raymond, to O. Hommel Company, The. Method of applying vitreous enamel ground coat. 3,906,124, Cl. 427-309.000.

Carl Freudenberg, Firma: *See—*
Boe, Hans, 3,906,131.

Carling O'Keefe Limited: *See—*
Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, 3,905,646.

Carlson, Ernest Reinhold, to Harvey Hubbell, Incorporated. Tamper-proof switch. 3,906,176, Cl. 200-42.00T.

Carlson, Jerome A.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Billings, David R., 3,905,710.

Carmichael, Charles D. Mounting system for electrical fixtures. 3,906,145, Cl. 174-61.000.

Carpaneti, Edoardo: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; Passalenti, Beppino; and Paparatto, Pietro, 3,905,948.

Carpenter, Charlie P., to Tappan Company, The. Evaporator coil assembly fitting mount. 3,905,789, Cl. 62-299.000.

Carpentier, John H., to Joerns Furniture Company. Vertically adjustable overbed table. 3,905,311, Cl. 108-136.000.

Carpino, Louis A.; and Han, Grace Y., to Research Corporation. Novel 9-fluorenylmethoxycarbonyl compounds. 3,906,031, Cl. 260-471.00C.

Carrier Corporation: *See—*
Miller, Arthur J., 3,905,197.

Carroll, Robert G., to United States of America, Health, Education and Welfare. Non-contact photographic identification device for labeling gamma camera images. 3,906,522, Cl. 354-105.000.

Carroll, Wallace E.; and Jackson, Richard D., to Bagley, Wallace E.; Wallace Industries Company; and Wilcox, Alan A., part interest to each. Method and apparatus for measuring prothrombin time and the like. 3,905,769, Cl. 23-230.00B.

Carter, Cecil O., to Phillips Petroleum Company. Alkyl fluoride production. 3,906,051, Cl. 260-653.600.

Carter-Wallace, Inc.: *See—*
Simon, Edward; Reisner, David B.; Ludwig, Bernard J.; Harakal, John J.; and Kletzkin, Milton, 3,905,977.

Cash, Carlton H.: *See—*
Adrian, Donald J.; and Cash, Carlton H., 3,906,493.

Cashin System Corporation: *See—*
Spooner, Robert J., 3,905,259.

Cassel, Thomas R. Pipe coupling with deformable outer sleeve. 3,905,623, Cl. 285-382.000.

Castaigne, Albert Rene, to Centre d'Etudes pour l'Industrie Pharmaceutique. New amino ether derivatives of orthothymotic esters. 3,906,030, Cl. 260-471.00R.

Castrodale, Daniel O.: *See—*
Anderson, Clifford W.; Castrodale, Daniel O.; and Martin, Jerry T., 3,906,141.

Cater, Thomas F.: *See—*
Rodgers, Daniel L.; and Cater, Thomas F., 3,906,420.

Caterpillar Tractor Company: *See—*
Gee, James E., 3,905,137.
Larson, Larry A., 3,905,633.
Maguire, Roy L.; Kupfert, Bernard F.; and Whitehurst, Gerald E., 3,905,607.
Myers, Kenneth R., 3,905,626.
Orr, Robert S., 3,905,661.
Stedman, Robert N.; and Moser, Raymond L., 3,905,497.

Caughey, Robert A. Self-feeding press for producing strip material. 3,905,290, Cl. 100-215.000.

Cavalier Packaging Company, Inc.: *See—*
Tipton, William G., 3,905,544.

Caylor, Henry J.; and Ives, Marion P., to Transcinor, Inc. Pallet head loader. 3,905,632, Cl. 294-67.00R.

Ceag Dominit, Aktiengesellschaft: *See—*
Winter, Karl; and Staschik, Gunter, 3,905,783.

Celanese Corporation: *See—*
Dirks, Jerald E.; and Organ, Glenn E., 3,906,036.

Central Glass Co., Ltd.: *See—*
Okuyama, Teruo, 3,905,261.

Centre d'Etudes pour l'Industrie Pharmaceutique: *See—*
Castaigne, Albert Rene, 3,906,030.

Centre Technique Industriel dit: Institut Textile de France: *See—*
Raisin, Jean-Pierre; and Helffer, Bernard, 3,905,211.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Bianchi, Paolo; Ramacciotti, Aldo; and Repetto, Eugenio, 3,905,803.

Ceraver: *See—*
Moussou, Jean; and Calvet, Robert, 3,905,758.
Weber, Jean, 3,905,759.

Cessna Aircraft Company, The: *See—*
Reimer, Leonard H., 3,905,194.

Cetenko, Wiaczeslaw A.: *See—*
Morrison, Glenn C.; and Cetenko, Wiaczeslaw A., 3,906,099.

CGR-Mev: *See—*
Levaillant, Claude; and Bensussan, Andre, 3,906,407.

Chadwick, William H., Jr., to Sherman & Reilly, Inc. Line transferring device. 3,905,581, Cl. 254-193.000.

Chamberlain Manufacturing Corporation: *See—*
Willmott, Colin B., 3,906,348.

Chamberlain, Patric N. Bumper for camper support vehicles. 3,905,527, Cl. 224-42.03A.

Champion International Corporation: *See—*
Vincent, David N.; and Golden, Ronald R., 3,906,123.

Charles-Messance, Francois; and Collobert, Ernest, to La Cellophane. Method and device for the fabrication of improved plastic and cellulose films. 3,905,583, Cl. 259-8.000.

Charman, Phillip. Thread or the like designs, drawings, pictures, patterns and creations. 3,905,133, Cl. 35-27.000.

Chemcut Corporation: *See—*
Goffredo, Daniel L.; and Dunkelberger, John Alfred, Jr., 3,905,827.

Chemetron Corporation: *See*—
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 3,905,362.
Chemiebau Dr. A. Zieren GmbH & Co. KG: *See*—
Furkert, Herbert, 3,906,039.
Chen, Evan N.; and Matthews, Hugh B., to Sperry Rand Corporation. Vibrator motor in hand-held electric appliance. 3,906,263, Cl. 310-29.000.
Cheng, King Y.: *See*—
Motley, David M.; and Cheng, King Y., 3,906,347.
Cherkasov, Jury Nikolaevich: *See*—
Lepp, Vladimir Romanovich; Vinogradov, Vladimir Alexeevich; Sibgatulin, Kharis Malikovich; and Cherkasov, Jury Nikolaevich, 3,906,289.
Cherne Industrial, Inc.: *See*—
Cherne, Lloyd G.; Grounds, Harry Cleveland; and Halvorson, Halvor O., 3,905,904.
Cherne, Lloyd G.; Grounds, Harry Cleveland; and Halvorson, Halvor O., to Cherne Industrial, Inc. Installation for sewage treatment. 3,905,904, Cl. 210-195.000.
Cherry, David J.: *See*—
Cowell, George K.; Cherry, David J.; and Considine, William J., 3,905,947.
Chi, Donald Dongsuk: *See*—
Goytisolo, Jorge Alberto; Chi, Donald Dongsuk; and Lee, Hanju, 3,906,076.
Chiarelli, Carl. Pipe tapping tool. 3,905,388, Cl. 137-318.000.
Chiba, Seiichi: *See*—
Ohshima, Iwao; Chiba, Seiichi; Shibuya, Yukio; and Ishikawa, Haruhiko, 3,905,122.
Chichester, Sidnor Tebbs, Jr. Light fixture with luminous signs. 3,905,141, Cl. 40-125.00F.
Chiu, Herman S., to Union Carbide Corporation. Tubular food casings. 3,905,397, Cl. 138-118.100.
Christie, George L. Close-up photography system. 3,905,700, Cl. 355-67.000.
Christman, Robert D.; Henke, Alfred M.; Paraskos, John A.; Wilson, Geoffrey R.; and Yanik, Stephen J., to Gulf Research & Development Company. Plural stage residue hydrodesulfurization process. 3,905,893, Cl. 208-210.000.
Chrysler Corporation: *See*—
Andersen, Poul H.; and Klacza, Robert E., 3,906,441.
Chu, Chin-Chiun: *See*—
Jurewicz, Anthony T.; Young, Lewis Brewster; and Chu, Chin-Chiun, 3,905,914.
Chubb Integrated Systems Limited: *See*—
Davies, Anthony Ivan Oliveira; and Goodfellow, James, 3,905,461.
Chur, Sung Pal, to Caelus Memories Inc. Fine and coarse track positioning system for a transducer in a magnetic recording system. 3,906,326, Cl. 318-594.000.
Churas, Algerd C.; and Hemrich, William R., to Sunbeam Corporation. Hair dryer with mist feature. 3,905,379, Cl. 132-9.000.
Church, Joseph H.: *See*—
Nielsen, John; and Church, Joseph H., 3,905,349.
Ciba-Geigy A.G.: *See*—
Biland, Hans Rudolf; Duennenberger, Max; and Luethi, Christian, 3,906,033.
Ciba-Geigy Corporation: *See*—
Cowell, George K.; Cherry, David J.; and Considine, William J., 3,905,947.
Dexter, Martin; and Knell, Martin, 3,905,939.
Francis, John E., 3,906,110.
Hoyle, William; and Savage, Michael Philip, 3,906,101.
Zondler, Helmut, 3,905,940.
Cidade, Humberto Jose De Carvalho. Card used on electronic computer for recording and collection of data intended for betting contests and similar contests. 3,906,192, Cl. 235-61.12R.
Cincinnati Milacron Inc.: *See*—
Reinhart, Lawrence Walter, 3,905,588.
Cities Service Research & Development Co.: *See*—
Gregoli, Armand A.; and Hartos, George R., 3,905,892.
Citizen Watch Co., Ltd.: *See*—
Nishikubo, Yasuhiko; Ebihara, Heihachiro; Hashimoto, Shingo; and Fukayama, Hiroyuki, 3,905,188.
Clancy, Raymond W.; and Huffman, John W., to Therm-O-Disc Incorporated. Cooking range and control therefor. 3,906,424, Cl. 337-394.000.
Clark, Dennis E.; and Kerr, William J., to Beecham, Inc. Crystalline anhydrous penicillins and preparation thereof. 3,905,960, Cl. 260-239.100.
Clark Equipment Company: *See*—
Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., 3,905,407.
Clary, Derwin R., to Trip Inspectors, Inc. Gauge for tubular members. 3,905,115, Cl. 33-143.00L.
Clausing, Challis I., to I-T-E Imperial Corporation. Current-limiting device for low-voltage electrical power systems. 3,906,413, Cl. 335-41.000.
Claussen, Lorenz, to Berliner Maschinenbau-AG vormals L. Schwartzkopff. Apparatus for use in the production of spiral-welded tubes or pipes. 3,905,536, Cl. 228-17.000.
Claxton, Dale H., to TRW Inc. Gunn effect power divider. 3,906,385, Cl. 330-5.000.
Clearwaters, Walter L.; Kingsbury, Frederick J.; Shippey, Carlyle E., Jr.; and Soderberg, John W., to United States of America, Navy. Search and track sonar system. 3,906,431, Cl. 340-6.00R.
Cleland, Luther A., Jr.: *See*—
Harmon, Albert D.; Martin, Charles R.; and Cleland, Luther A., Jr., 3,905,187.
Clerk, Robert Cecil. Hydraulic pistons. 3,905,281, Cl. 92-143.000.
Clipp, Louis L.: *See*—
Hall, J. Michael; and Clipp, Louis L., 3,905,552.
Cobaugh, Robert Franklin: *See*—
Lynch, James Edward; Parmer, Kenneth Ronald; and Cobaugh, Robert Franklin, 3,905,665.
Cobb, Raymond L.: *See*—
Bresson, Clarence R.; and Cobb, Raymond L., 3,906,042.
Cochrane, Robin Adam, to Girling Limited. Master cylinder assemblies for hydraulic systems. 3,905,656, Cl. 303-50.000.
Coffee, Ronald Alan. Electrostatic deposition of particles. 3,905,330, Cl. 118-629.000.
Coffen, David Llewellyn; and Fryer, Rodney I., to Hoffmann-La Roche Inc. 1,2,-Heterocyclic-1,4-Benzodiazepines. 3,906,001, Cl. 260-327.00R.
Cognaco, Jean-Claude, to Societe Anonyme dite: Hexachime. Chlorinated derivatives of 1-(2-Δ^2-imidazolinyl)-2,2-diarylcyclopropanes. 3,905,993, Cl. 260-309.600.
Cohen, Arthur I.: *See*—
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,906,087.
Cohen, Bernard D.; and Zeewy, Abraham, to Crysta-Dent, Inc. Dental implant member. 3,905,109, Cl. 32-10.00A.
Cohen, Jules Barry: *See*—
Hartnett, John J.; Cohen, Jules Barry; and Scordato, Emil A., 3,905,772.
Colbourn, Joseph L.: *See*—
Kotick, Michael Paul; Patel, Chimanbhai P.; Colbourn, Joseph L.; and Erickson, Robert J., 3,905,953.
Colchester, John Edward; and Blundell, Thomas, to Imperial Chemical Industries Limited. Manufacture of 1,1-disubstituted-4,4-bipyridylium salts. 3,905,986, Cl. 260-296.00D.
Coleman Company, Inc., The: *See*—
Farley, Ray Scott, 3,906,253.
Colenbrander, August: *See*—
Gordon, Michael S.; Colenbrander, August; and Patterson, Darrell G., 3,905,130.
Colgate-Palmolive Company: *See*—
Colodney, Daniel, 3,906,090.
Lajovic, Dusan S., 3,906,070.
Schnettler, Richard A.; and Suh, John T., 3,905,980.
Collins, Byron R.; and McVey, Charles I., to General Electric Company. Low wattage high pressure sodium vapor lamps. 3,906,272, Cl. 313-214.000.
Collobert, Ernest: *See*—
Charles-Messance, Francois; and Collobert, Ernest, 3,905,583.
Colodney, Daniel, to Colgate-Palmolive Company. Clear dentifrice. 3,906,090, Cl. 424-52.000.
Colombo, Americo. Dental injection gun. 3,905,365, Cl. 128-218.00C.
Comark Industries, Incorporated: *See*—
Musiak, Ronald E., 3,906,350.
Combustion Engineering, Inc.: *See*—
Kronk, Richard Eugene, 3,906,469.
Prestridge, Floyd L.; Wallace, Harry G.; and Meyers, Rex T., 3,905,891.
Stone, Robert Martin, 3,906,358.
Comfort Products, Inc.: *See*—
Gross, Alexander Louis; and Giese, Erik O., 3,906,185.
Commissariat a l'Energie Atomique: *See*—
Andre, Pierre; Duole, Claude; and Stadnikoff, Wladimir, 3,906,383.
Commonwealth of Australia, the Secretary Department of Supply, The: *See*—
Guster, Allan; and Patterson, Jeffrey E., 3,906,504.
Commonwealth Scientific and Industrial Research Organization: *See*—
Floyd, John Millice, 3,905,807.
Hawthorne, David Geoffrey, 3,905,936.
Holan, George, 3,906,035.
Communication Mfg. Co.: *See*—
Sparrevohn, Frederic R., 3,906,162.
Compagnie d'Applications Micaniques a l'Electronique (CAMECA): *See*—
Guernet, Jacques; and Boissel, Pierre, 3,906,225.
Compagnie Electro-Mecanique: *See*—
Delassus, Jean, 3,905,417.
Comptoir Lyon-Alemand-Louyot: *See*—
Lacroix, Roger, 3,905,777.
Computer Identics Corporation: *See*—
Tuhro, Richard H., 3,906,379.
Cone, Charles N.; and Steinberg, Julius M., to Pacific Adhesives Company, Inc. Apparatus for the uniform application of foamed liquid mixtures to substrates. 3,905,329, Cl. 118-602.000.
Cone, Charles N.; and Steinberg, Julius M., to Pacific Adhesives Company, Inc. Rapidly-foamable, fast-setting phenolic resin plywood glue. 3,905,921, Cl. 260-2.50F.
Conklin, Delano M.: *See*—
Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., 3,905,928.
Connolly, Terrence E., to General Electric Company. Bilateral series feed for array antennas. 3,906,502, Cl. 343-100.0SA.
Conrad, Bernhard; and Heinzelmann, Karl-Georg, to Siemens Aktiengesellschaft. Gamma camera. 3,906,234, Cl. 250-366.000.

Conrad, Rene A., to Dynaloc Corporation. Compression hub apparatus for mounting a cylindrical body to a rotatable shaft. 3,905,209, Cl. 64-15.00R.

Considine, William J.: *See—*
Cowell, George K.; Cherry, David J.; and Considine, William J., 3,905,947.

Consolidation Coal Company: *See—*
Davis, David H., 3,905,127.
Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., 3,906,080.
Poundstone, William N., 3,905,430.

Construction Materials, a division of General Electric Company: *See—*
Herzog, Rollie R., 3,906,243.

Continental Can Company, Inc.: *See—*
Pacilio, Joseph C., 3,905,317.

Continental Oil Company: *See—*
Neuworth, Martin B., 3,906,050.
Sparlin, Derry D.; and Kolb, Clarence B., Jr., 3,905,423.

Control Concepts, Inc.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 3,905,575.

Control Data Corporation: *See—*
Desmonds, Daniel J.; Tate, Donald P.; and Robbins, Douglas A., 3,906,459.
Strom, Richard Albert, 3,906,451.
Velishek, Francis P.; and Bonnie, G. Patrick, 3,906,467.

Cook, Gordon Henry; and Fawcett, John Anthony, to Rank Organisation Limited, The. Optical beam splitting system. 3,905,684, Cl. 350-173.000.

Cook, John Hayward, to Xerox Corporation. Clutches. 3,905,247, Cl. 74-82.000.

Cook, William J.; and Ellens, Gordon A., to Leon Chemical & Plastics Div. of U.S. Industries Inc. Dip molding process. 3,906,071, Cl. 264-255.000.

Cooksey, James Judson: *See—*
Boggs, Beryl Aaron; Cooksey, James Judson; Newell, Harry Lee, Jr.; and Showers, John Walter, 3,905,075.

Cooksey, William Harold, to Joseph Lucas (Industries) Limited. Ignition distributors. 3,905,095, Cl. 29-598.000.

Cooley, Richard F., to Owens-Illinois, Inc. Glass laser discs with annular alkali lead borate coatings and uses thereof. 3,906,396, Cl. 331-94.50D.

Coombs, Garth; Butterworth, Elbert Roy; and Bell, George Richard, to Johns-Manville Corporation. Method for making filter aids dispersible in hydrocarbon liquids and the dispersible products. 3,905,910, Cl. 252-259.500.

Cooper, Andrew K. Directory display case. 3,905,139, Cl. 40-64.00R.

Cooper, Duane H. Signal matrixing for directional reproduction of sound. 3,906,156, Cl. 179-1.0GQ.

Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., to Motorola, Inc. Radio telephone system. 3,906,166, Cl. 179-41.00A.

Cooper, Robert P. Grain drying process. 3,905,124, Cl. 34-33.000.

Cope, Geoffrey Wilton, to Dresser Industries, Inc. Snubbed railway truck bolster. 3,905,305, Cl. 105-197.00D.

Corbellini, Margherita; and Balducci, Agostino, to Snam Progetti S.p.A. Catalyst system for the homo- and co-polymerization of olefins, conjugated or unconjugated dienes. 3,905,913, Cl. 252-429.00A.

Corbin, George T., Jr. Cartridge-actuated device and launching assembly using same. 3,905,291, Cl. 102-39.000.

Corning Glass Works: *See—*
Bagley, Rodney D., 3,905,743.
Grossman, David G., 3,905,824.

Coronado, Telesforo G. Signaling system for use on automotive vehicles. 3,905,435, Cl. 180-1.0AP.

Coronet Container: *See—*
Heavner, Larry W.; and Gidewall, Kenneth L., 3,905,282.

Corp, Paul M.: *See—*
Cargill, Don A.; Corp, Paul M.; and Forster, Lloyd M., 3,905,171.

Corporation of Gonzaga University, The: *See—*
Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., 3,905,784.

Corse, Louis, to Societe d'Etudes de Machines Speciales. Apparatus for regulating tension in sheet material. 3,905,533, Cl. 226-44.000.

Costa, Eugen; Ene, Lucian; Dumitrescu, Stelica; and Covaci, Ion, to Policlinica de Stomatologie Protetica a Muncipiului Bucuresti. Method for fabricating dental bridges dental crowns and coronoradicular retainers. 3,905,106, Cl. 32-2.000.

Coulter, Gordon L.; and Pearsall, Duane D., to Rixson-Firemark, Inc. Condition responsive door holder-closer. 3,905,063, Cl. 16-48.500.

Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R., 3,905,887.

Coupin, Claude; and Deval, Alain, to Societe d'Applications Generales d'Electricite et de Mecanique. Brushless electric motors. 3,906,267, Cl. 310-68.00R.

Cournoyer, Bernard T.: *See—*
Dean, Carl J.; Wright, David M.; and Cournoyer, Bernard T., 3,905,484.

Cousins, Morison S. Unitary container and closure with dispensing means and apparatus for storage thereof. 3,905,539, Cl. 229-4.500.

Covaci, Ion: *See—*
Costa, Eugen; Ene, Lucian; Dumitrescu, Stelica; and Covaci, Ion, 3,905,106.

Coveney, Joseph F.; and La Clair, Louis M., to Union Carbide Corporation. Air separation with work expansion to high and low pressure rectification stages. 3,905,201, Cl. 62-13.000.

Cowell, George K.; Cherry, David J.; and Considine, William J., to Ciba-Geigy Corporation. Organo-nickel salts as adhesion promotors for vulcanizable elastomers to metals. 3,905,947, Cl. 260-79.50R.

Cowman, George Wilbur, to Black and Decker Manufacturing Company, The. High inertia insulating cooling fan for electric motor device. 3,906,266, Cl. 310-60.00R.

Cox, James R. Container filling control. 3,905,404, Cl. 141-46.000.

Crabtree, Allen, to Imperial Chemical Industries Limited. Reactive disazo dyestuffs containing 1-aminoalkyl-6-hydroxypyrid-6-one and monochlorotriazinyl groupings. 3,905,950, Cl. 260-153.000.

Cradeur, Robert R., to Browning-Ferris Industries, Inc. Apparatus for flame-cleaning pipe. 3,905,061, Cl. 15-4.000.

Crafton, Paul A. Security system for lock and key protected secured areas. 3,906,447, Cl. 340-149.00A.

Crane, Hewitt David; and Savoie, Robert Ellis, to Stanford Research Institute. Special pen and system for handwriting recognition. 3,906,444, Cl. 340-146.3SY.

Crawford, Duncan J.: *See—*
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Bruan, Eric A.; and Walke, Earl W., Jr., 3,905,280.

Crawford, William C.: *See—*
Tucker, Richard B. C.; and Crawford, William C., 3,905,088.

Creators Limited: *See—*
Stent, Vernon Denis, 3,905,853.

Creusot-Loire: *See—*
Tribellini, Aldo, 3,905,901.

Crimmins, David J.; and Sinclair, William Y., to Aries Electronics, Inc. Shorting plug for an integrating circuit socket. 3,905,667, Cl. 339-19.000.

Crommentuyn, Gerardus J.; Hagendoorn, Joannes A.; and Knibbe, Hendrik, to Oce-van der Grinten N.V. Dibenzothiophene oxide or dioxide sensitizers for organic photoconductors. 3,905,814, Cl. 96-1.500.

Croughwell, William J., to Emhart Corporation. Computer control for glassware forming machine. 3,905,793, Cl. 65-163.000.

Cruse, Brentwood A. Bag support stand. 3,905,406, Cl. 141-390.000.

Cruse, Clyde L., Jr.; and Kerschbaum, Arthur P., to Armco Steel Corporation. Method for the direct reduction of iron ores. 3,905,806, Cl. 75-35.000.

Crysta-Dent, Inc.: *See—*
Cohen, Bernard D.; and Zeewy, Abraham, 3,905,109.

CTS Corporation: *See—*
English, Jack A., 3,906,179.

Cudahy, Michael J.; and Sherwood, Robert D., to Marquette Electronics, Inc. Artifact detector. 3,905,364, Cl. 128-2.06R.

Cunningham, Maceo. Grab-all fish holder. 3,905,145, Cl. 43-53.500.

Curley, James H.: *See—*
Anhalt, John W.; and Curley, James H., 3,905,670.

Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, to Karl Kroyer St. Anne's Limited. Multi-ply fibrous sheets. 3,905,864, Cl. 162-133.000.

Cutter Laboratories, Inc.: *See—*
Lewis, Dan, Jr.; Von Alven, Raymond D.; and Prouty, Myron R., 3,905,368.

CWW Research and Development Company: *See—*
Willis, Arnold L.; and Wortman, Harold, 3,905,057.

Cyre, Roger Allan: *See—*
Cyre, Ronald Eugene; and Cyre, Roger Allan, 3,905,547.

Cyre, Ronald Eugene; and Cyre, Roger Allan. Cribbage board. 3,905,547, Cl. 235-90.000.

Czerwinski, Watson P., to United States of America, Army. Impedance simulator for simulating the impedance of an antenna radiating in an open space over a selected frequency band. 3,906,403, Cl. 333-22.00R.

D. S. Brown Company, The: *See—*
Mayer, James E., 3,905,084.

Dahlmans, Johannes J.; and Boesten, Wilhelmus H. J., to Stamlcarbon N.V. Process for the preparation of 2 thion-oxazolidinones and derivatives thereof. 3,905,988, Cl. 260-307.00B.

Dahm, Manfred: *See—*
Meussdoerffer, Johann Nikolaus; Niederprum, Hans; and Dahm, Manfred, 3,906,027.

Dai Nippon Printing Co., Ltd.: *See—*
Tawara, Junro; and Ohhashi, Masanori, 3,905,096.

Daigoh, Kiyokazu: *See—*
Tsurumi, Takashi; Emori, Shuichi; Daigoh, Kiyokazu; Ikegami, Takemi; and Kaneko, Tutomu, 3,906,130.

Daimler-Benz Aktiengesellschaft: *See—*
Hornung, Walter, 3,905,651.
Zaiser, Wolfgang, 3,905,252.

Dainichi-Nippon Cables, Ltd.: *See—*
Hiraoka, Yukio; Nakao, Sadao; and Noda, Yoshinobu, 3,906,139.

Dale, Charles Harry, to Pav-Saver Corporation. Track driven machines with torsion bar-activated controls. 3,905,715, Cl. 404-84.000.

Dale, William T.: *See—*
Pitman, Raymond F.; and Dale, William T., 3,906,369.

D'Alelio, Gaetano F. Polymerizable lignin derivatives. 3,905,926, Cl. 260-17.500.

Dalle, Jean-Paul, to Societe Anonyme dite: Omnium de Prospective Industrielle S.A. Processes for treating polyamides. 3,905,763, Cl. 8-128.00R.

Damiano, Frank. Animated display tree-frame. 3,905,140, Cl. 40-106.250.

Damois, Pierre, to Etablissements Damois Freres. Removable insulating cover for generally cylindrical containers. 3,906,129, Cl. 428-99.000.

Damon Corporation: *See*—
Maddestra, Robert; and Munn, David E., 3,905,754.
Dana Corporation: *See*—
Osenbaugh, Carl D.; and Bollet, Ronald E., 3,905,089.
Shea, Dennis W., 3,905,457.
Daniel, Rene A., to OPI-Textile. Apparatus for the impregnation with a treating liquid and for the squeezing of a textile product running continuously. 3,905,327, Cl. 118-50.000.
Danis, Nadine M., legal representative: *See*—
Danis, Roger P., deceased; and Danis, Nadine M., legal representative, 3,906,313.
Danis, Roger P., deceased; and by Danis, Nadine M., legal representative. Plural motor synchronizing apparatus. 3,906,313, Cl. 318-85.000.
Dapcich, John Bernard. Limb cooling apparatus. 3,905,367, Cl. 128-254.000.
Darcy, Lynne: *See*—
Roach, William Ronald; and Darcy, Lynne, 3,905,683.
Darm, William J. Method of manufacture of an air-to-air heat exchanger. 3,905,850, Cl. 156-91.000.
David, Ernest J., to Aerojet-General Corporation. Method of purification of cation regenerant solution. 3,905,903, Cl. 210-31.00C.
David, Michel, to Logabax Anoiennement Ateliers Bariquand & Marre. Method and device for adjusting contrast in photographic and photomechanical reproduction work. 3,905,701, Cl. 355-71.000.
Davies, Anthony Ivan Oliveira; and Goodfellow, James, to Chubb Integrated Systems Limited. Access-control equipment. 3,905,461, Cl. 194-4.00C.
Davis, Charles, Jr., to Union Carbide Corporation. Method of making battery separators. 3,905,851, Cl. 136-131.000.
Davis, David H., to Consolidation Coal Company. Apparatus for drying heat sensitive particulate material. 3,905,127, Cl. 34-182.000.
Davis, Ernest D., to Norfin, Inc. Memory and visual indicator system for sorting device. 3,905,594, Cl. 271-173.000.
Davis, J. Lee, to Avance Oil & Gas Company, Inc. Multi-directional seismic exploration methods. 3,906,433, Cl. 340-15.5MC.
Davis, James M. Adjustable reading aid. 3,905,573, Cl. 248-445.000.
Dawn, Alan William, to E. S. Perry Limited. Blocks having sockets and projections with interference fit. 3,905,150, Cl. 46-25.000.
Days-Ease Home Products Corporation: *See*—
Bauer, Henry, 3,905,909.
De Sota, Inc.: *See*—
Rokadia, Abdullah M.; and Gaske, Joseph E., 3,905,550.
Dean, Carl J.; Wright, David M.; and Cournoyer, Bernard T., to Barry Wright Corporation. Flexible dividers for lateral shelf filing. 3,905,484, Cl. 211-184.000.
DeAngelis, Costanzo. Method and apparatus for mounting a plumbing fixture. 3,905,052, Cl. 4-252.00R.
Dearlove, Thomas J.: *See*—
Campbell, Gregory A.; Dearlove, Thomas J.; and Meluch, William C., 3,906,019.
Debusk, Autrey O. V. Boot for a foot cast. 3,905,135, Cl. 36-2.50R.
Decker, Thomas A.; Kuether, Christian L.; Williams, Robert E.; and Logar, Noel D., to Baylor College of Medicine. Apparatus for determining the acuity of a human. 3,905,688, Cl. 351-30.000.
Deering Milliken Research Corporation: *See*—
McCullough, Robert W., 3,905,210.
Short, Joe T., 3,905,857.
de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Pressure-modulation device applicable especially to the braking circuit of an automobile vehicle and a braking circuit equipped with said device. 3,905,655, Cl. 303-21.00F.
de Graffenried, Albert L., to Photocircuits Division of Kollmorgen Corporation. High density flux magnetic circuit. 3,906,268, Cl. 310-154.000.
Del Norte Technology, Inc.: *See*—
Parker, William H., 3,906,352.
De Lang, Rudolf: *See*—
Marx, Arthur Friedrich; and De Lang, Rudolf, 3,905,962.
Delassus, Jean, to Compagnie Electro-Mecanique. Electromagnetic rabbling mechanism for continuously pouring molten metal. 3,905,417, Cl. 164-147.000.
Delingat, Eckart, to Ernst Leitz G.m.b.H. Optical correlator. 3,906,220, Cl. 250-227.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, to Wisconsin Alumni Research Foundation. 3-Deoxy-1α-hydroxycholecalciferol. 3,906,014, Cl. 260-397.200.
DeMarco, Thomas M., to NFE International, Ltd. Hose coupling or adapter for industrial vacuum units. 3,905,621, Cl. 285-7.000.
DeMeester, Gordon D.; Barrett, Harrison H.; and Wilson, David T., to Raytheon Company. High energy spatially coded image detecting systems. 3,906,229, Cl. 250-336.000.
Dempsey, John J.: *See*—
Gibbs, Francis E.; and Dempsey, John J., 3,906,184.
de Navas Albareda, Jose Luis, to Repla International S.A.H. Arrangement for securing coating strips on a wall. 3,905,062, Cl. 16-4.000.
de Niet, Edmond, to U.S. Philips Corporation. Signal transmission system. 3,906,154, Cl. 178-69.50R.
Denkinger, Marian C. Feminine hygiene protective shield. 3,905,372, Cl. 128-285.000.
Dennhardt, Werner: *See*—
Schroter, Herbert; and Dennhardt, Werner, 3,905,698.
Dennis, Harry: *See*—
Guy, Kenneth Ronald; Dennis, Harry; and Hood, Robert Burns, 3,905,722.
Dennis, James T. Spindle adaptor for automatic record changers. 3,905,604, Cl. 274-10.00S.
Dennison, Charles M.; and Hogue, Noel E., to Rockwell International Corporation. Constant gain switching amplifier apparatus. 3,906,375, Cl. 328-71.000.
Denton, David Alan: *See*—
Krause, Janusz Josef Henryk; and Denton, David Alan, 3,906,122.
Dentsply Research & Development Corporation: *See*—
Gonser, Donald L., 3,905,373.
Denyo Kagaku Kogyo Kabushiki Kaisha: *See*—
Konda, Kichiro, 3,905,745.
Depenbrock, Manfred, to Brown, Boveri & Cie, AG. Arrangement for feeding a DC load circuit from single phase or polyphase AC voltage mains with economizing of idle power consumption of load alternating current. 3,906,337, Cl. 321-10.000.
De Puy, Robert P., to General Electric Company. Semiconductor valve assembly and bus arrangement for high current low voltage electric power converter. 3,906,336, Cl. 321-8.00R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Tricyclic benzodiazepines. 3,905,956, Cl. 260-239.30T.
De Rop, Walter Jan Roza Adolf: *See*—
Spiessens, Raymond Francois; and De Rop, Walter Jan Roza Adolf, 3,906,275.
Derr, Robert E.: *See*—
Ahlers, William H.; Derr, Robert E.; and Sahling, La Monte H., 3,905,523.
DeSchaaf, Clifford L.: *See*—
Getz, Edward H.; and DeSchaaf, Clifford L., 3,906,341.
Desmonds, Daniel J.; Tate, Donald P.; and Robbins, Douglas A., to Control Data Corporation. Binary data manipulation network having multiple function capability for computers. 3,906,459, Cl. 340-172.500.
Deters, Elmer M.: *See*—
Fowler, Kirk; and Deters, Elmer M., 3,905,405.
Deubel, Karl; Weber, Willi; and Schuchmann, Dieter, to Kuleg Kuhlmobelfabrik & Apparatebau GmbH. Refrigeration apparatus. 3,905,206, Cl. 62-373.000.
Deutsch, Marshall E.: *See*—
Mead, Louis W.; and Deutsch, Marshall E., 3,905,521.
Deutsche Automobilgesellschaft mbH, Firma: *See*—
Bader, Christian, 3,906,329.
Deutsche Babcock & Wilcox Aktiengesellschaft: *See*—
Grommes, Helmut; and Lehr, Willi, 3,905,557.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Schuster, Rolf, 3,905,472.
Deval, Alain: *See*—
Coupin, Claude; and Deval, Alain, 3,906,267.
Dexter, Martin; and Knell, Martin, to Ciba-Geigy Corporation. 3,5-Dialkyl-4-hydroxyphenyl derivatives of triazines. 3,905,939, Cl. 260-45.80N.
Deyrup, Edward Johnson, to Du Pont de Nemours, E. I., and Company. Process for electroplating polyoxymethylene. 3,905,877, Cl. 204-30.000.
Dienes, Andrew; Shank, Charles Vernon; and Trozzolo, Anthony Marion, to Bell Telephone Laboratories, Incorporated. Broad band exciplex dye lasers. 3,906,399, Cl. 331-94.50L.
Diessner, Armin: *See*—
Hashoff, Lothar; Luxa, Gunther; Thurk, Joachim; and Diessner, Armin, 3,906,149.
Digital Data Systems, Inc.: *See*—
Siems, Lee E., 3,906,487.
Digital Dynamics, Inc.: *See*—
Jerde, James B., 3,905,394.
Di Giugno, Angelo J.: *See*—
Boyce, James J.; Di Giugno, Angelo J.; and Masi, James V., 3,905,463.
Dini, John R. Combination ski binding strap and ski boot fastener. 3,905,610, Cl. 280-11.37A.
Dinicola, Frank Peter. Decorative device. 3,906,215, Cl. 240-10.00R.
Dirks, Jerald E.; and Organ, Glenn E., to Celanese Corporation. Reduction of chloride content in olefin derivatives such as vinyl acetate. 3,906,036, Cl. 260-497.00R.
Displaytek Corporation: *See*—
Ruggiero, Edward M., 3,905,094.
Dittmar, Bruce Ivor, to Du Pont de Nemours, E. I., and Company. Paint fungicide. 3,905,930, Cl. 260-29.6MN.
Dixon, Samuel, Jr., to United States of America, Army. Ferrite power limiter comprising synchronously tuned, resonant cavities. 3,906,404, Cl. 333-17.000.
Dixon, William I., to Monsanto Company. Alpha,alpha-diphosphonato acetanilides. 3,906,062, Cl. 260-932.000.
Dobson, William, to Marconi Company Limited, The. Signal transmission systems with doppler shift compensation. 3,906,364, Cl. 325-4.000.
Doemen, Benno, to Papst-Motoren KG. Control of brushless D-C motors. 3,906,320, Cl. 318-331.000.
Doerksen, David P.; and Bennett, Paul I. Electronic rhythm-teaching machine. 3,905,269, Cl. 84-470.000.
Dohi, Nobuyasu; and Kamon, Mikio, to Hyogo Prefectural Government. Electrolyte for and method of bright electroplating of tin-lead alloy. 3,905,878, Cl. 204-43.00S.
Dominy, Beryl William; Hess, Hans-Jurgen Ernst; and Koch, Richard Carl, to Pfizer Inc. Quinazolinones as novel herbicides. 3,905,800, Cl. 71-92.000.

Dommaschk, Walter: *See*—
Andelfinger, Claus; Dommaschk, Walter; Ott, Werner; Ulrich, Manfred; and Weber, German. 3,906,280.
Donley, Michael J., to Scott, Alan. Adaptor unit for use with fluid nozzles. 3,905,622, Cl. 285-338.000.
Donovan, Jeremiah J.: *See*—
Hatfield, James M.; and Donovan, Jeremiah J., 3,905,351.
Dorman Smith Switchgear Limited: *See*—
Kidd, Alan Lister; Eaves, Douglas; and Walmsley, Keith, 3,906,414.
Dorn, Peter, to Texaco Inc. Carburetor detergent and corrosion inhibiting motor fuel compositions. 3,905,781, Cl. 44-71.000.
Doshi, Chandra P; and Pridmore, Lawrence W., to GTE Sylvania Incorporated. Means for effecting dynamic vertical convergence in an in-line plural beam cathode ray tube. 3,906,418, Cl. 335-210.000.
Dostert, Philippe; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Tricyclic imines. 3,905,972, Cl. 260-247.50R.
Dotter, Berton E., Jr., to GTE Automatic Electric Laboratories Incorporated. Cable pair testing arrangement. 3,906,174, Cl. 179-175.30R.
Dow Chemical Company, The: *See*—
Kushlefsky, Bernard G.; and Whitney, Wendell K., 3,906,103.
Downing, James W.; Fernandez, Carlos P.; and Sethre, Vernon C., to McDonnell Douglas Corporation. Electrical primary flight control system. 3,905,241, Cl. 74-470.000.
Dowthwaite, Edwin; and Hiskens, Ian Richard, to Tenneco Chemicals, Inc. Sizing compositions comprising fortified rosin and their preparation and use in paper. 3,906,142, Cl. 428-498.000.
Draayer, Jan: *See*—
Brenski, Edwin F.; Draayer, Jan; Reynolds, Nigel J. E.; and Risky, Frank A., 3,906,163.
Draft Systems, Inc.: *See*—
Johnston, Mack S., 3,905,522.
Drage, David J., to Air Products and Chemicals, Inc. Method and apparatus for recovery of metals from scrap. 3,905,556, Cl. 241-24.000.
Dragomier, John D.; and Stargell, Donald E., to Van Dorn Company. Can end with protective bead. 3,905,514, Cl. 220-273.000.
Drake, William H.: *See*—
Harmon, Albert D.; Martin, Charles R.; and Drake, William H., 3,905,186.
Dreibelbis, Richard C.; Homeyer, Arthur C.; and Turner, Warren E., to Emerson Electric Co. Remote dispensing head with a concealed expansion chamber for heated fluid dispensing systems. 3,905,518, Cl. 222-146.0HE.
Dresser Industries, Inc.: *See*—
Cope, Geoffrey Wilton, 3,905,305.
Williams, Raymond Leroy; and Walker, Ross Weldon, 3,905,426.
Dronsuth, Richard W.: *See*—
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.
DSO "Metalurgia i Rudodobiv": *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.
DT Liquidating Partnership: *See*—
Schiffman, Murray M., 3,906,384.
Du Bois, Donald W., to PPG Industries, Inc. Method of treating titanium-containing structures. 3,905,837, Cl. 148-6.14R.
Dudley, Irving C., to Ram Research Incorporated. Dual mode fluidic ventilator. 3,905,363, Cl. 128-145.800.
Duennenberger, Max: *See*—
Biland, Hans Rudolf; Duennenberger, Max; and Luethi, Christian, 3,906,033.
DuHamel, Raymond H. Circularly polarized helix and spiral antennas. 3,906,509, Cl. 343-895.000.
Duistermaat, Jan Hendrik; and Panis, Constantius Johannes Waltherus, to U.S. Philips Corporation. Deflection coil system for color television. 3,906,288, Cl. 315-13.00C.
Dull, Hans-Jurgen, to Siemens Aktiengesellschaft. Switch for a magnetic suspension railroad. 3,905,303, Cl. 104-130.000.
Dumitrescu, Stelica: *See*—
Costa, Eugen; Ene, Lucian; Dumitrescu, Stelica; and Covaci, Ion, 3,905,106.
Dunkelberger, John Alfred, Jr.: *See*—
Goffredo, Daniel L.; and Dunkelberger, John Alfred, Jr., 3,905,827.
Dunnet, George, to Uniroyal Limited. Liquid-conveying hose. 3,905,399, Cl. 138-129.000.
Duo-Fast Corporation: *See*—
Novak, Raymond F.; Ramspeck, Howard B.; Geist, Bernard W.; and Potucek, Frank R., 3,905,535.
Duole, Claude: *See*—
Andre, Pierre; Duole, Claude; and Stadnikoff, Wladimir, 3,906,383.
Du Pont de Nemours, E. I., and Company: *See*—
Deyrup, Edward Johnson, 3,905,877.
Dittmar, Bruce Ivor, 3,905,930.
Evans, Robert F.; and Unger, William L., 3,905,673.
Fawzi, Maged M., 3,905,801.
Frankfort, Hans R. E.; and Lyons, Peter F., 3,905,077.
Gobeil, Richard John; and Haglid, Frank Runar, 3,905,973.
Khanna, R. T., 3,905,937.
Mrowca, Joseph J., 3,906,015.
Perkins, Melvin A.; and Urion, Howard K., 3,905,949.
Schlatter, Rudolph; and Adams, Charles De Witt, 3,905,991.
Sowards, Donald Maurice; and Watson, Richard N., 3,905,775.
Speck, Stanley B., 3,905,952.
DuPree, Donald G.; Bailey, Raymond E.; and Ling, Chester H. K., to Xerox Corporation. Electroforming mandrel. 3,905,400, Cl. 138-140.000.
Duran, Edward N.: *See*—
United States of America, National Aeronautics and Space Administration; Silver, Robert H.; Lewis, Gilbert W.; Feldstein, Cyril; and Duran, Edward N., 3,905,356.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Pyridyl substituted thioalkyl-and oxyalkyl-thioureas and ureas. 3,905,984, Cl. 260-294.80H.
Durst, Richard R., to General Tire & Rubber Company, The. Compatible polymer alloys. 3,906,057, Cl. 260-876.00B.
Durst, Richard R., to General Tire & Rubber Company, The. High impact two-component resin blends. 3,906,058, Cl. 260-876.00B.
Duwel, Dieter: *See*—
Franz, Raimund; and Duwel, Dieter, 3,906,034.
Dyer, Frederick N., to United States of America, Navy. Hidden knowledge detector. 3,905,132, Cl. 35-22.00R.
Dyer, Mahlon D.: *See*—
Smith, Charles W.; and Dyer, Mahlon D., 3,906,239.
Dynaloc Corporation: *See*—
Conrad, Rene A., 3,905,209.
Dynamics Research Corporation: *See*—
Bakewell, Joseph J., 3,905,817.
Dynamit Nobel Aktiengesellschaft: *See*—
Schneider, Ernst; Simon, Manfred; Weiss, Richard; Hover, Alexander; and Treutler, Christian, 3,906,065.
Dzus Fasterer Co., Inc.: *See*—
Dzus, Theodore; and Schenk, Peter, 3,905,411.
Dzus, Theodore; and Schenk, Peter, to Dzus Fasterer Co., Inc. Fastener receptacle with protective cap. 3,905,411, Cl. 151-21.00R.
E. R. Squibb & Sons, Inc.: *See*—
Hauck, Frederic Peter, 3,906,032.
Lee, Bong Kuk; Ryu, Dewey D. Y.; Miraglia, Gennaro John; Basch, Harold I.; and Mukherjee, Barid B., 3,905,955.
E. S. Perry Limited: *See*—
Dawn, Alan William, 3,905,150.
E-Systems, Inc.: *See*—
Fitch, Troy W., 3,906,479.
Earley, James Valentine: *See*—
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 3,905,956.
Easter, William M.: *See*—
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, 3,905,919.
Eastman Kodak Company: *See*—
Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., 3,905,938.
Ettischer, Helmut, 3,906,525.
Harvey, Donald M., 3,906,516.
Krutak, James J., Sr., 3,905,999.
Ruben, Paul Lewis, 3,905,686.
Rubin, Jacob C.; and Swapceinski, John P., 3,906,475.
Easton, Nelson R.; and Hargrove, William W., to Eli Lilly and Company. 2-Halo-1-(alkyl-1-(alkylamino) ethyl) vinyl alkanoic esters and derivatives. 3,906,028, Cl. 260-468.00R.
Eaton Corporation: *See*—
Esser, Ernst S., 3,905,635.
Gee, Thomas A., 3,905,668.
Macrae, Ralph, 3,905,070.
O'Callaghan, Gerald F.; and Woelz, Donald D., 3,906,327.
Swedberg, Nils Einar, 3,905,728.
Eaves, Douglas: *See*—
Kidd, Alan Lister; Eaves, Douglas; and Walmsley, Keith, 3,906,414.
Ebauches S.A.: *See*—
Grimm, Maurice; and Vuilleumier, Maurice, 3,905,666.
Eberly, Charles E., to Bemiss-Jason Corporation. Holder for paper rolls. 3,905,532, Cl. 225-35.000.
Ebihara, Heihachiro: *See*—
Nishikubo, Yasuhiko; Ebihara, Heihachiro; Hashimoto, Shingo; and Fukayama, Hiroyuki, 3,905,188.
Eckenbrecht, Robert Roy, to GTE Sylvania Incorporated. Automatic alignment method and apparatus for tuner mechanism. 3,906,368, Cl. 325-452.000.
Ed. Scharwachter KG: *See*—
Brockhaus, Ernst, 3,905,064.
Eddy, Frank M. Slitting wheel holder. 3,905,264, Cl. 83-481.000.
Edmund, James M. Anti-friction device for safety ski binding. 3,905,906, Cl. 280-11.35C.
Edwards, Thomas C., to Rovac Corporation, The. Auxiliary porting arrangement for noise control in compressor-expander. 3,905,204, Cl. 62-296.000.
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Bruan, Eric A.; and Walke, Earl W., Jr., to Ex-Cell-O Corporation. Apparatus for welding thermoplastic coated paperboard cartons. 3,905,280, Cl. 93-44.10R.
Ehara, Toshiyasu: *See*—
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, 3,906,378.

Ehlers, Randall Gordon, to Burroughs Corporation. Odd-sized memory having a plurality of even-sized storage elements of the same capacity. 3,906,458, Cl. 340-172.500.

Ehrmann, Oskar; Zimmermann, Frank; and Friedrich, Ludwig, to Knoll A.G. Chemische Fabriken. Basically substituted benzimidazole derivatives. 3,905,990, Cl. 260-309.200.

Eisai Co., Ltd.: *See—*
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, 3,906,378.

Eisenberg, Bernard, to Solbern Corporation. Product spreading machine and method. 3,905,326, Cl. 118-24.000.

Eisenwerke Reintjes GmbH: *See—*
Liebich, Rudolf, 3,905,459.

Elachi, Charles: *See—*
United States of America, National Aeronautics and Space Administration; and Elachi, Charles, 3,906,393.

Eli Lilly and Company: *See—*
Booher, Richard N., 3,905,987.
Easton, Nelson R.; and Hargrove, William W., 3,906,028.
Kukolja, Stjepan P.; and Lammert, Steven R., 3,905,966.
Miller, Richard P., 3,906,085.
Webber, J. Alan, 3,905,963.

Eliasson, Lars Erik Bertil: *See—*
Holmqvist, Per Goran; and Eliasson, Lars Erik Bertil, 3,905,687.

Ellens, Gordon A.: *See—*
Cook, William J.; and Ellens, Gordon A., 3,906,071.

Ellis, Daniel A.: *See—*
Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,905,718.

Elnicki, Walter Joseph: *See—*
Villalobos, Joseph Alfred; and Elnicki, Walter Joseph, 3,905,126.

Elsan Limited: *See—*
Stokes, John H.; and Bondon, Raymond, 3,905,049.

Elwood, Albert A.; and Patterson, James. Cryogenic control valve. 3,905,424, Cl. 169-46.000.

Emenaker, Leo Joseph: *See—*
Barrus, Gordon Brent; Emenaker, Leo Joseph; and Melissa, Raymond Franklin, 3,905,294.

Emerson Electric Co.: *See—*
Dreibelbis, Richard C.; Homeyer, Arthur C.; and Turner, Warren E., 3,905,518.

Emhart Corporation: *See—*
Croughwell, William J., 3,905,793.
Taft, Donald L.; Smith, Victor W.; and Schumacher, Neal P., 3,905,202.

Emmel, Frank E. Newspaper vending machine. 3,905,530, Cl. 221-155.000.

Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,905,984.

Emori, Shuichi: *See—*
Tsurumi, Takashi; Emori, Shuichi; Daigoh, Kiyokazu; Ikegami, Takemi; and Kaneko, Tutomu, 3,906,130.

Emus, Ronald W., to Southern Machinery Company. Apparatus for producing hems on cloth articles by means of adhesive. 3,905,860, Cl. 156-459.000.

Ene, Lucian: *See—*
Costa, Eugen; Ene, Lucian; Dumitrescu, Stelica; and Covaci, Ion, 3,905,106.

Eng, Jeffrey D.; and Harke, Cyril J., to Hooker Chemicals & Plastics Corporation. Electrolytic manufacture of dithionites. 3,905,879, Cl. 204-92.000.

Engebretsen, Einar O., to Hobart Corporation. Compactor with separate bin for receiving materials. 3,905,289, Cl. 100-215.000.

Engel, Alexander: *See—*
United States of America, National Aeronautics and Space Administration; and Engel, Alexander, 3,906,374.

Engeler, William E.; and Tiemann, Jerome J., to General Electric Company. Semiconductor imaging detector device. 3,906,544, Cl. 357-24.000.

English Electric Valve Company Limited: *See—*
Horton, Laurence Henry; and Batey, Peter Harvey, 3,906,278.

English, Hugh James. Flareholder. 3,905,324, Cl. 116-63.00P.

English, Jack A., to CTS Corporation. Electrical switch and combination electrical resistor and switch. 3,906,179, Cl. 200-68.000.

Enoki, Kichiji; Yao, Toshio; Ishimitsu, Keiichi; Tsukashima, Keiichi; and Ikari, Eiichi, to Nippon Soda Company, Limited. Process for the production of thiophane derivatives. 3,905,995, Cl. 260-309.700.

Ensslin, Frieder H.; and Yarnall, Paul J., to Sybron Corporation. Dental x-ray machine. 3,906,227, Cl. 250-320.000.

Enter, William L. Automatic interior environment control. 3,905,153, Cl. 47-58.000.

Epple, Richard, to Telefunken Patentverwertungsgesellschaft m.b.H. Photoelectric semiconductor devices. 3,905,836, Cl. 148-1.500.

Erickson, Robert J.: *See—*
Kotick, Michael Paul; Patel, Chimanbhai P.; Colbourn, Joseph L.; and Erickson, Robert J., 3,905,953.

Eriksson, Albert Samuel. Battery-operated hand lamp. 3,906,216, Cl. 240-6.40W.

Erlichman, Irving, to Polaroid Corporation. Shaft drive and control system for automatic camera. 3,906,527, Cl. 354-152.000.

Ernst Leitz G.m.b.H.: *See—*
Delingat, Eckart, 3,906,220.
Meyding, Lothar, 3,905,119.

Erwinsick Optik-elektronik: *See—*
Langenbach, Erwin, 3,905,679.

Esashika, Tadashi, to Sony Corporation. Protective circuit for a main transistor in a monolithic integrated circuit. 3,906,310, Cl. 317-33.0VR.

Esser, Ernst S., to Eaton Corporation. Material grasping clamp assembly. 3,905,635, Cl. 294-88.000.

Esthetic Hair, Inc.: *See—*
Levin, Donald; and Ward, Walter D., 3,905,378.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,905,761.

Etablissement Public de Diffusion: *See—*
Mignot, Lucien E., 3,906,210.

Etablissements Damois Freres: *See—*
Damois, Pierre, 3,906,129.

Etablissements E. Ragonot: *See—*
Margrain, Pierre, 3,905,818.

Etat Francais: *See—*
Astier, Paul Georges; and Canaby, Pierre, 3,906,222.

Ethyl Corporation: *See—*
Lanier, Carroll W., 3,906,053.

Eto, Mikio: *See—*
Hattori, Shuzo; Eto, Mikio; Morino, Kenji; and Fujita, Tuyoshi, 3,906,510.

Ettischer, Helmut, to Eastman Kodak Company. Photographic camera having a variable speed mechanical shutter. 3,906,525, Cl. 354-149.000.

Eurofloor S.A.: *See—*
Bomboire, Rene F., 3,905,849.

Evans, Donald W.: *See—*
Goza, Alva L.; Smith, Fay D.; Bentkowski, L. E.; Evans, Donald W.; Blake, Ronald P.; and Thompson, Jimmie L., 3,905,050.

Evans, James P., to Johnson, Paul H. Combination torqueing and ratcheting wrench for 12-point members. 3,905,255, Cl. 81-119.000.

Evans, Robert F.; and Unger, William L., to Du Pont de Nemours, E. I., and Company. Header block. 3,905,673, Cl. 339-192.00R.

Evans, Wayne Wheeler, to RCA Corporation. Digital tuning of voltage control television tuners. 3,906,351, Cl. 325-459.000.

Evans, William O., Jr. Soundproofing enclosures. 3,905,444, Cl. 181-33.00K.

Evensen, Thomas J., to Minnesota Mining and Manufacturing Company. Print sheet. 3,906,138, Cl. 428-320.000.

Ex-Cell-O Corporation: *See—*
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Bruan, Eric A.; and Walke, Earl W., Jr., 3,905,280.

Excelsior Belting-Equipment Co., Inc.: *See—*
Abolafia, Antonio, 3,905,138.

Exotech, Incorporated: *See—*
Hall, J. Michael; and Clipp, Louis L., 3,905,552.

Exxon Nuclear Company Inc.: *See—*
Welty, Richard K., 3,906,081.

Exxon Research and Engineering Company: *See—*
Riley, Kenneth L.; House, William T.; and Hofmann, John E., 3,905,916.
Wristers, Harry J., 3,905,915.

Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., to Chemetron Corporation. Volume-rate respirator system and method. 3,905,362, Cl. 128-145.800.

F. Joseph Lamb Company: *See—*
VanDeberg, Walter H., 3,905,466.

Fabio, Paul Frank: *See—*
Tomcuecik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, 3,905,974.

Fabre, Pierre, to Air Industrie. Spray booth bottom collector. 3,905,785, Cl. 55-96.000.

Fairbairn, Douglas G., to Xerox Corporation. Signal processor. 3,906,194, Cl. 235-92.0MP.

Falk, Richard A. Pneumatic metal sampler. 3,905,238, Cl. 73-425.600.

Fanshawe, William Joseph; and Safir, Sidney Robert, to American Cyanamid Company. Method of producing a depressant effect using 5-cyclopropyl-1,2,4-oxadiazol-3-yl diazines. 3,906,097, Cl. 424-250.000.

Fanstone, William G. Traction device. 3,905,359, Cl. 128-75.000.

Farha, Floyd E., Jr., to Phillips Petroleum Company. Oxidative dehydrogenation of alkenes of alkadienes to furan compounds using certain V-P catalyts. 3,906,009, Cl. 260-346.10R.

Farkas, John A., to Raymond Lee Organization, Inc., The. Lawn roller device. 3,905,716, Cl. 404-128.000.

Farley, Ray Scott, to Coleman Company, Inc., The. Power-regulated thermostat control system for heating/cooling use. 3,906,253, Cl. 307-117.000.

Farlow, Jan M., to Minnesota Mining and Manufacturing Company. Mechanical drum positioning and sheet-clamping mechanism for facsimile. 3,906,512, Cl. 346-138.000.

Farrell, John J., to Farrell Patent Company. Apparatus for longitudinal stretch for blow molding. 3,905,738, Cl. 425-389.000.

Farrell Patent Company: *See—*
Farrell, John J., 3,905,738.

Fawcett, John Anthony: *See—*
Cook, Gordon Henry; and Fawcett, John Anthony, 3,905,684.

Fawzi, Maged M., to Du Pont de Nemours, E. I., and Company. Substituted 1,2,4-triazine-5-ones as herbicides. 3,905,801, Cl. 71-93.000.

Federal Sign and Signal Corporation: *See—*
Gosswiller, Earl W.; Hsu, Dick T.; Williams, Richard H.; and Iacono, Joel G., 3,906,491.

Feezor, Michael D.; and Preslar, Mack J., to Audiometric Teleprocessing, Inc. Audiometric pretest trainer. 3,905,131, Cl. 35-13.000.

Fehlmann, Willy: *See—*
Mindt, Wolfgang; and Fehlmann, Willy, 3,905,888.

Feinleib, Julius; and Lipson, Stephen G., to Itek Corporation. Optical storage device using piezoelectric read-out. 3,906,462, Cl. 340-173.0LS.

Feist, Wieland; and Stachel, Hans-Joachim. Optical level. 3,905,707, Cl. 356-249.000.

Feldmann, Fritz K., to Pacific Technica Corporation. Discarding sabot projectiles. 3,905,299, Cl. 102-93.000.

Feldstein, Cyril: *See—*
United States of America, National Aeronautics and Space Administration; Silver, Robert H.; Lewis, Gilbert W.; Feldstein, Cyril; and Duran, Edward N., 3,905,356.

Feldtkeller, Ernst, to Siemens Aktiengesellschaft. Digital magneto optical instrument for high voltage systems. 3,906,343, Cl. 324-96.000.

Felty, Lanny G., to Johnson & Johnson. Stabilized tretinoin cream emulsion. 3,906,108, Cl. 424-318.000.

Ferlin, William J.; and Mayer, Nelson G., to Lincoln Brass Works, Inc. Shutter structure and mixing tube assembly for gas burner. 3,905,756, Cl. 431-354.000.

Fernandez, Carlos P.: *See—*
Downing, James W.; Fernandez, Carlos P.; and Sethre, Vernon C., 3,905,241.

Feterl, Leon G., to SOS Consolidated, Inc. Trailer frame structure. 3,905,644, Cl. 298-22.0AE.

Fiber Industries, Inc.: *See—*
Harris, Dennis K., 3,905,076.

Fiddler, Theodore E. Electromotive and fluid pressure force switch with maze valves. 3,906,177, Cl. 200-61.860.

Fiddler, Theodore E.; and Adams, Arnold G., to Fiddler, Theodore E. Electrical fluid switch with crossing slide chambers. 3,906,178, Cl. 200-61.860.

Fiedler, Howard C., to General Electric Company. Method of producing silicon-iron sheet material with boron addition and product. 3,905,843, Cl. 148-111.000.

Fieri, Anthony J.: *See—*
Peterson, Dale S.; Vartikian, Onick M.; and Fieri, Anthony J., 3,905,478.

Figueroa, Ramon: *See—*
Peterman, Donald J.; and Figueroa, Ramon, 3,905,322.

Filipovich, Danny, to Bell & Howell Company. Zoom lens mechanism. 3,906,529, Cl. 354-196.000.

FIME: *See—*
Lapeyronnie, Andre Gabriel, 3,905,347.

Finch, William A.; Loughridge, Frederick A.; and Marcucci, Rudolf, to GTE Sylvania Incorporated. Apparatus for making high intensity discharge arc tube. 3,905,795, Cl. 65-279.000.

Finelli, Anthony F., to Goodyear Tire & Rubber Company, The. Polyurethane prepared with 4,4'-diamino diphenyl disulfide. 3,905,944, Cl. 260-75.0NH.

Finike Italiana Marposs-Soc. In Accomandita Semplice di'Mario Possati & C.: *See—*
Anichini, Cesare, 3,906,470.

Fink, Peter; and Gorlitz, Werner, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Switch, especially for magnetically and pneumatically floating vehicles. 3,905,302, Cl. 104-130.000.

Finkenzeller, Johann: *See—*
Schorr, Hermann; Schaefer, Willi; Finkenzeller, Johann; and Wittkopp, Fritz, 3,905,591.

Fiorentini, Carlo. Foamed material molding head. 3,905,582, Cl. 259-4.000.

Fire Alert Company: *See—*
Lehsten, George S., 3,906,474.

Fischer, Heimbert. Dental X-ray photographic device. 3,906,235, Cl. 250-404.000.

Fisher, Dalziel L. Computerized lighting system. 3,906,301, Cl. 315-97.000.

Fishman, Norman; and Parkinson, Dean B., to Stanford Research Institute. Epoxy resin with metal salt of bisphenol or novolac as fire resistant composition. 3,906,055, Cl. 260-831.000.

Fitch, Troy W., to E-Systems, Inc. Time interval computer. 3,906,479, Cl. 340-309.100.

Fitzpatrick, Paul, to General Motors Corporation. Centrifugal compressor diffuser. 3,905,721, Cl. 415-211.000.

Fleming, Robert W.: *See—*
Albrecht, William L.; and Fleming, Robert W., 3,906,007.

Floden, Bjorn Fritjof, to RCA Corporation. Film projector apparatus. 3,905,691, Cl. 352-29.000.

Florent, Jean: *See—*
Belloc, Andre; Florent, Jean; Mancy, Denise; and Verrier, Jean, 3,906,113.

Florian, John, to Mobil Oil Corporation. Tray. 3,905,506, Cl. 220-23.800.

Florjancic, Dusan, to Klein, Schanzlin and Becker Aktiengesellschaft. Shaft seal lift-off arrangement. 3,905,606, Cl. 277-27.000.

Flow Research, Inc.: *See—*
Olsen, John H.; and Thomas, Benjamin A., 3,905,608.

Floyd, John Millice, to Commonwealth Scientific and Industrial Research Organization. Recovery of tin from slags. 3,905,807, Cl. 75-85.000.

Flutie, Richard E., to Harris Corporation. Nitrocellulose protective coating on masks used in IC manufacture. 3,906,133, Cl. 428-172.000.

Foldes, Peter, to RCA Corporation. Multimode horn antenna. 3,906,508, Cl. 343-786.000.

Foley, Donald E. Adjustable jaw ratchet type drive tool. 3,905,256, Cl. 81-165.000.

Food Technology, Inc.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,906,114.

Ford, Charles E.: *See—*
Ford, Clancy B.; and Ford, Charles E., 3,905,103.

Ford, Clancy B.; and Ford, Charles E. Grass trimming device for a sprinkler. 3,905,103, Cl. 30-276.000.

Ford Motor Company: *See—*
Freismuth, Richard J.; and Lopiccola, Joseph F., 3,905,346.

Foreman, Lester. Liner for maintaining paint and brush and method for using same. 3,905,476, Cl. 206-361.000.

Forgione, Peter Salvatore, to American Cyanamid Company. Alkaline phosphatase test material. 3,905,872, Cl. 195-103.50R.

Forster, Lloyd M.: *See—*
Cargill, Don A.; Corp, Paul M.; and Forster, Lloyd M., 3,905,171.

Fosnaugh, James E.: *See—*
Campbell, Earle E.; and Fosnaugh, James E., 3,905,231.

Foster Wheeler Corporation: *See—*
Gamble, Robert L.; and Bryers, Richard William, 3,905,336.

Fowler, John T., to Arthur D. Little, Inc. Compass display circuit. 3,906,483, Cl. 340-336.000.

Fowler, Kirk; and Deters, Elmer M., to Weil-McLain Company, Inc. Gasoline dispensing and vapor recovery system. 3,905,405, Cl. 141-46.000.

Fowler, Richard O. Circuit board continuity testing device. 3,906,363, Cl. 324-158.00F.

Fowler, Ronald James; and Freeh, Edward James, to Industrial Nucleonics Corporation. Method and apparatus for controlling a tobacco dryer. 3,905,123, Cl. 34-31.000.

Fox, Carl B., Jr. Valves with low opening and closing gate friction against the seats. 3,905,576, Cl. 251-327.000.

Fraioli, Anthony V.: *See—*
Frazee, Lawrence E.; and Fraioli, Anthony V., 3,906,426.

Francis, John E., to Ciba-Geigy Corporation. Antihypertensive α-(1-aralkylaminoalkyl)-aralkoxybenzyl alcohols. 3,906,110, Cl. 424-330.000.

Franck, Gunter; and Busch, Lothar, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Low pressure mercury vapor discharge lamp with amalgam. 3,906,284, Cl. 313-490.000.

Frank, Edmund, to Packard Instrument Company, Inc. Elevator mechanism and method. 3,905,453, Cl. 187-17.000.

Frankfort, Hans R. E.; and Lyons, Peter F., to Du Pont de Nemours, E. I., and Company. Process for crimping polyester filament yarn. 3,905,077, Cl. 28-72.170.

Franz, Raimund; and Duwel, Dieter, to Hoechst Aktiengesellschaft. Trifluoromethyl-salicylanilides. 3,906,034, Cl. 260-479.00R.

Fraser, Lawrence J.; and Parker, Delmer G., to Xerox Corporation. Electrostatic development method using magnetic brush configuration transport. 3,906,121, Cl. 427-18.000.

Frass, Werner, to Hoechst Aktiengesellschaft. Light sensitive copolymers, a process for their manufacture and copying compositions containing them. 3,905,820, Cl. 96-86.00P.

Fraze, Ermal C. Container closure having easy-opening means. 3,905,503, Cl. 215-255.000.

Frazee, Lawrence E.; and Fraioli, Anthony V., to Plessey Incorporated. Humidity sensor. 3,906,426, Cl. 338-35.000.

Frechette, Thomas E.; and Rosborg, Daniel J., to Litton Business Systems, Inc. Ribbon change apparatus. 3,905,464, Cl. 197-170.000.

Frechette, Thomas E.; and Rosborg, Daniel J., to Litton Business Systems, Inc. Error correcting typewriter. 3,905,465, Cl. 197-181.000.

Freeh, Edward James: *See—*
Fowler, Ronald James; and Freeh, Edward James, 3,905,123.

Freeman, Billy P. Material transfer system. 3,905,650, Cl. 302-53.000.

Freismuth, Richard J.; and Lopiccola, Joseph F., to Ford Motor Company. Choke cap altitude kit. 3,905,346, Cl. 123-119.00F.

Frey, Gary D.: *See—*
Lind, Harold V.; and Frey, Gary D., 3,906,411.

Frey, Sydney W., Jr.; and Gaines, Robert W., to Bourns, Inc. Potentiometer terminations. 3,906,428, Cl. 338-143.000.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 2-(6-Sulfo-2-naphthyl)propionic acid. 3,906,038, Cl. 260-507.00R.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Fink, Peter; and Gorlitz, Werner, 3,905,302.
Leisterer, Reinhard, 3,906,339.

Friedrich, Ludwig: *See—*
Ehrmann, Oskar; Zimmermann, Frank; and Friedrich, Ludwig, 3,905,990.

Friedrich, Richard; and Rindelaub, Frank A. E., to International Presspack Company. Device for holding and discharging liquid and pastelike substances under pressure. 3,905,517, Cl. 222-95.000.

Fritz, Alton L., to Royal Industries, Inc. Postforming. 3,905,861, Cl. 156-499.000.

Fritz, Dieter: *See—*
Nessler, Norbert; and Fritz, Dieter, 3,906,361.

Fryer, Rodney I.: *See—*
Coffen, David Llewellyn; and Fryer, Rodney I., 3,906,001.

Fryer, Rodney Ian: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 3,905,956.

Fuji Electric Company Ltd.: *See—*
Hirao, Kenichi, 3,906,322.

Fuji Heavy Industries Ltd.: *See—*
Nagoshi, Saburo, 3,905,563.

Fuji Photo Film Co., Ltd.: *See*—
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,905,821.
Oshima, Shigeru, 3,906,524.
Oshima, Shigeru, 3,906,530.
Tadokoro, Eiichi; and Aonuma, Masashi, 3,905,779.
Takahama, Sho; and Hamada, Yoichi, 3,906,535.

Fujinami, Akira: *See*—
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.

Fujioka, Koichiro; and Tano, Takeo, to Iwatsu Electric Co., Ltd. Electrophotography using CRT exposure and liquid developer. 3,905,811, Cl. 96-1.0LY.

Fujita, Masatoshi, to Aisin Seiki Kabushiki Kaisha. Hood latching device for automotive vehicles. 3,905,624, Cl. 292-11.000.

Fujita, Masatoshi, to Aisin Seiki Kabushiki Kaisha. Door lock mechanism. 3,905,627, Cl. 292-216.000.

Fujita, Tuyoshi: *See*—
Hattori, Shuzo; Eto, Mikio; Morino, Kenji; and Fujita, Tuyoshi, 3,906,510.

Fujitsu Fanuc Limited: *See*—
Shichida, Hiromichi; Toyoda, Kenichi; and Irie, Seiji, 3,906,262.

Fujitsu Ltd.: *See*—
Miyamoto, Bunichi; Tanishima, Yasuo; and Shimizu, Takafumi, 3,906,382.
Shichida, Hiromichi; Toyoda, Kenichi; and Irie, Seiji, 3,906,262.

Fukayama, Hiroyuki: *See*—
Nishikubo, Yasuhiko; Ebihara, Heihachiro; Hashimoto, Shingo; and Fukayama, Hiroyuki, 3,905,188.

Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Top stops for slide fasteners. 3,905,073, Cl. 24-205.11R.

Fukushima, Mitsuru: *See*—
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.

Fukushima, Yutaka: *See*—
Sakurai, Kiyomi; Fukushima, Yutaka; and Takimoto, Yasuyuki, 3,905,819.

Furkert, Herbert, to Chemiebau Dr. A. Zieren GmbH & Co. KG. Recovery of sulfur dioxide from sulfuric acid containing ferrous sulfate. 3,906,039, Cl. 423-540.000.

Furlano, Roland V. Helicopter muffler system. 3,905,564, Cl. 244-17.110.

Furukawa Electric Co., Ltd., The: *See*—
Shiga, Shoji, 3,905,907.

Furuta, Kazuyoshi: *See*—
Hikai, Akio; Kobayashi, Yoshiyuki; and Furuta, Kazuyoshi, 3,905,572.

Furutani, Yoshio: *See*—
Kurimura, Yasuo; Furutani, Yoshio; Makiguchi, Nobuyoshi; and Souda, Kenji, 3,905,867.

Futurinvest AG: *See*—
Stadler, Reinhard, 3,905,504.

G. Bischoff Bau Kompletter Gasreinigungs- und Wasserruckkuhlanlagen KG, Firma: *See*—
Hausberg, Gerhard; Kruger, Georg; and Zentgraf, Karl-Martin, 3,906,078.

G. D. Searle & Co.: *See*—
Yonan, Peter K., 3,905,982.

G & H Technology, Inc.: *See*—
McCormick, Larry L., 3,905,669.

G. L. Rexroth GmbH: *See*—
Hartwig, Manfred, 3,905,393.

G. T. Schjeldahl Company: *See*—
Menke, James A.; and Haak, Eugene L., 3,905,567.

Gabos, Theodore D.: *See*—
Larson, Robert M.; and Gabos, Theodore D., 3,905,488.

Gaetani, Ermanno; and Massabo, Vincenzo, to Aziende Colori Nazionali Affini ACNA S.p.A. Azo-acetyl-acetaryl pigment compositions readily dispersed in organic media. 3,905,825, Cl. 106-308.00N.

GAF Corporation: *See*—
Randall, David I.; and Wynn, Robert W., 3,905,799.

Gaines, Robert W.: *See*—
Frey, Sydney W., Jr.; and Gaines, Robert W., 3,906,428.

Gaitten, W. Maynard, to Soderhamn Machine Manfacturing Company. Wood chipper. 3,905,558, Cl. 241-55.000.

Gallagher, Hayden E.; and Knauer, Wolfgang, to Hughes Aircraft Company. Bipolar crossed-field switch tube with uniform magnetic field. 3,906,270, Cl. 313-157.000.

Gallay, Francis J., to Techni-Plaste S.A. Fuel tank for automobile vehicles. 3,905,505, Cl. 220-22.000.

Galletti, Cesare, to Innocenti Santeustacchio S.p.A. Winding apparatus for sheet metal strip. 3,905,218, Cl. 72-148.000.

Gallo, Roberto A. Crypt front removable mounting means. 3,905,169, Cl. 52-137.000.

Gamble, John G. Reeds for saxophones, clarinets and other woodwinds. 3,905,268, Cl. 84-383.000.

Gamble, Robert L.; and Bryers, Richard William, to Foster Wheeler Corporation. Apparatus and method for generating heat. 3,905,336, Cl. 122-4.00D.

Gamell, Joseph A. Radiant heat boiler. 3,906,188, Cl. 219-275.000.

Gandy, Gerald C.: *See*—
Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., 3,905,938.

Ganellin, Charon Robin: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,905,984.

Gardikes, John J., to Ashland Oil, Inc. Phenolic resin-polyisocyanate binder systems containing dialkyl phthalate solvents. 3,905,934, Cl. 260-31.80T.

Gardner, Joseph G.: *See*—
See, Gary G.; and Gardner, Joseph G., 3,905,293.

Gardner, Phillip J.: *See*—
Silver, H. Graham; Gardner, Phillip J.; Heller, Adam; and Argue, Gary R., 3,906,274.

Garretson, Aline L.: *See*—
Sobin, Ben A.; Routien, John B.; Rao, Koppaka V.; Marsh, William S.; and Garretson, Aline L., 3,906,093.

Garretson, Oliver R.; and Harmon, Richard C., to Xynetics, Inc. Microelectronic test probe card including a multiplicity of probe contacts and method of making same. 3,905,098, Cl. 29-628.000.

Garrison, Ward S. Flexible coupling. 3,905,207, Cl. 64-10.000.

Garritt, Robert H., Jr.: *See*—
Peterson, Raymond L.; and Garritt, Robert H., Jr., 3,905,265.

Gaske, Joseph E.: *See*—
Rokadia, Abdullah M.; and Gaske, Joseph E., 3,905,550.

Gateshill, Henry Charles; and Shepherd, Norris Wilfred, to Air Products and Chemicals, Inc. Apparatus for depositing solid carbon dioxide. 3,905,555, Cl. 239-573.000.

Gawrilow, Ilija, to SCM Corporation. Hydrated pan release agents. 3,906,117, Cl. 426-420.000.

Geating, John A., to General Electric Company. Method for preparing slides for blood evaluation. 3,906,120, Cl. 427-4.000.

Gebhardt, Richard. Stow roller train. 3,905,470, Cl. 198-127.00R.

Gebr. Bohler & Co. Aktiengesellschaft: *See*—
Hasewend, Florian, 3,905,431.

Gebr. Hofmann KG: *See*—
Himmler, Gunther; and Ohms, Klaus-Peter, 3,905,224.

Gee, James E., to Caterpillar Tractor Company. Underwater tractor and implement therefor. 3,905,137, Cl. 37-56.000.

Gee, Thomas A., to Eaton Corporation. Sealing band for electrical connector. 3,905,668, Cl. 339-60.00M.

Geier, Horst W. Rotary mower. 3,905,182, Cl. 56-13.600.

Geist, Bernard W.: *See*—
Novak, Raymond F.; Ramspeck, Howard B.; Geist, Bernard W.; and Potucek, Frank R., 3,905,535.

Gem Industries Inc.: *See*—
Bryant, Robert G., 3,905,625.

General Electric Company: *See*—
Anderson, John R.; and Boros, Steve, 3,905,078.
Benz, Mark C., 3,905,840.
Benz, Mark G., 3,905,839.
Collins, Byron R.; and McVey, Charles I., 3,906,272.
Connolly, Terrence E., 3,906,502.
De Puy, Robert P., 3,906,336.
Engeler, William E.; and Tiemann, Jerome J., 3,906,544.
Fiedler, Howard C., 3,905,843.
Geating, John A., 3,906,120.
Giles, Walter B., 3,906,265.
Goronkin, Herbert, 3,906,541.
Grenoble, Herebert E., 3,905,842.
Hinrichsen, Eric N., 3,905,216.
Hoeschele, David F., Jr.; and Barnes, Eugene H., 3,906,172.
Hoeschele, David F., Jr.; and Berger, Gerald B., 3,906,367.
Krackhardt, Elliott M.; and Nolan, William J., 3,906,282.
Macur, Robert A.; LeBlanc, Oliver H., Jr.; and Grubb, Willard T., 3,905,889.
Takekoshi, Tohru; and Kochanowski, John E., 3,905,942.

General Engines Co., Inc.: *See*—
O'Neill, Joseph P., Jr., 3,905,442.

General Instrument Corporation: *See*—
Lipsky, Stephen E., 3,906,505.

General Mills, Inc.: *See*—
Campbell, Glenn M.; and Krassas, James G., 3,905,285.

General Motors Corporation: *See*—
Campbell, Gregory A.; Dearlove, Thomas J.; and Meluch, William C., 3,906,019.
Fitzpatrick, Paul, 3,905,721.
Heilman, Gerald D.; and Paddock, Gordon R., 3,905,193.
Thomas, Douglas A.; and Stambaugh, Terry L., 3,905,735.
Week, Nils P.; Shellman, Carl E.; and Koivunen, Erkki A., 3,905,274.
Williams, Hugh A., Jr., 3,905,348.

General Tire & Rubber Company, The: *See*—
Durst, Richard R., 3,906,057.
Durst, Richard R., 3,906,058.

Gensel, Peter: *See*—
Kompa, Karl L.; Gensel, Peter; and Wanner, Jochen, 3,906,395.

Genson, Billie Lee, to Morton Buildings, Inc. Door lifting and positioning means. 3,905,486, Cl. 214-1.00H.

George, James Stanley, to BPB Industries, Ltd. Process for the conversion of anhydrite into gypsum. 3,906,083, Cl. 423-555.000.

Gerhards, Erich: *See*—
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.

Gerken, John M., to TRW Inc. Resistance-weldable stud. 3,905,173, Cl. 52-758.00B.

Gerner, Daniel F.; and Sauter, Richard S., to Packaging Coordinators Inc. Packaging. 3,905,479, Cl. 206-531.000.

Gerritsen, Jan, to U.S. Philips Corporation. Colour television display apparatus incorporating a television display tube. 3,906,303, Cl. 315-370.000.

Getman, Anatoly Fedorovich: *See—*
Shulzhenko, Alexandr Alexandrovich; and Getman, Anatoly Fedorovich, 3,906,082.

Getz, Edward H.; and DeSchaaf, Clifford L., to Whirlpool Corporation. Fault detector for igniter testing using high frequency noise. 3,906,341, Cl. 324-62.000.

Ghelfi, Fiovanni, to Intereko S. A. Process for the dehydration and granulation of manure-base fertilizers. 3,905,796, Cl. 71-21.000.

Ghilardi, Giuliana: *See—*
Zviak, Charles; and Ghilardi, Giuliana, 3,906,091.

Gibbs, Francis E.; and Dempsey, John J., to Kaiser Aluminum & Chemical Corporation. Welding process. 3,906,184, Cl. 219-131.00F.

Gibert, Guy; and Vidal, Pierre. Mounting device for oscillatory crystal which converts torsional vibrations to flexural vibrations. 3,906.249, Cl. 310-9.100.

Gibson, Geoffrey Moorhouse: *See—*
Middleton, Robert; Timms, Peter Leslie; and Gibson, Geoffrey Moorhouse, 3,906,017.

Gidewall, Kenneth L.: *See—*
Heavner, Larry W.; and Gidewall, Kenneth L., 3,905,282.

Giese, Erik O.: *See—*
Gross, Alexander Louis; and Giese, Erik O., 3,906,185.

Gilbert, Richard D.: *See—*
Johnson, Amos N.; and Gilbert, Richard D., 3,905,376.

Giles, Walter B., to General Electric Company. Honeycomb stator inserts for improved generator cooling. 3,906,265, Cl. 310-55.000.

Gill, Charles L. Apparatus for producing lens blocking tools. 3,905,739, Cl. 425-405.00R.

Gillette Company, The: *See—*
Lindemann, Martin K. O., 3,906,021.

Girling Limited: *See—*
Cochrane, Robin Adam, 3,905,656.

Givaudan Corporation: *See—*
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, 3,905,919.

Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, to Food Technology, Inc. Solidified product from high fructose corn syrup and process. 3,906,114, Cl. 426-641.000.

Glarner, Fritz, to Sprecher & Schuh AG. Gas-blast switch. 3,906,180, Cl. 200-148.00A.

Glaser, Arthur Barry, to Bell Telephone Laboratories, Incorporated. Three-word adder carry propagation. 3,906,211, Cl. 235-175.000.

Glaswerk Schuller GmbH: *See—*
Keib, Heinz; and Schlachter, Fredo, 3,905,067.

Glaverble-Mecaniver: *See—*
Plumat, Emile; Schottey, Jean; and Toussaint, Francois, 3,905,791.

Gleason, David I.; and Anderson, Ehnerd H., to R. C. Allen, Inc. Photo-optical pickoff for gyro. 3,905,244, Cl. 74-5.60A.

Gliszewski, Henryk: *See—*
Lewandowski, Witold; Werkowski, Ryszard; and Gliszewski, Henryk, 3,905,434.

Global Marine Inc.: *See—*
Hooper, David William, 3,905,580.

Globe-Union Inc.: *See—*
Weissman, Eugene Yehuda; and Mahato, Basanta Kumar, 3,905,829.

Glory Kogyo Kabushiki Kaisha: *See—*
Ushio, Masatoshi, 3,905,176.

Gnyra, Bohdan, to Alcan Research and Development Limited. Precipitation of alumina trihydrate from bayer pregnant liquors. 3,906,084, Cl. 423-629.000.

Gobeil, Richard John; and Haglid, Frank Runar, to Du Pont de Nemours, E. I., and Company. Thiol methylation with methyl chloride. 3,905,973, Cl. 260-248.0AS.

Goffredo, Daniel L.; and Dunkelberger, John Alfred, Jr., to Chemcut Corporation. Etchant rinse method. 3,905,827, Cl. 134-13.000.

Goi, Hitoshi: *See—*
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Golden, Ronald R.: *See—*
Vincent, David N.; and Golden, Ronald R., 3,906,123.

Goldfuss, George T., to United States of America, Energy Research and Development Administration. Liquid-level sensing device. 3,905,243, Cl. 73-295.000.

Gondek, John T. Planetary gear pump. 3,905,726, Cl. 418-56.000.

Gonser, Donald I., to Dentsply Research & Development Corporation. Electrosurgical device. 3,905,373, Cl. 128-303.140.

Goodfellow, James: *See—*
Davies, Anthony Ivan Oliveira; and Goodfellow, James, 3,905,461.

Gooding, Dennis Jay; and Anderson, Peter Holden, to Adams-Russell Co. Transfer function realization with one-bit coefficients. 3,906,400, Cl. 332-11.00D.

Goodman, David S.: *See—*
Anhalt, John W.; Goodman, David S.; and Burns, Edgar, 3,905,672.

Goodrich, Hunter Crary, to United States of America, Navy. Signal processor system. 3,906,496, Cl. 343-9.000.

Goodyear Tire & Rubber Company, The: *See—*
Finelli, Anthony F., 3,905,944.

Gordesky, Stanley E.: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,906,087.

Gordon, Michael S.; Colenbrander, August; and Patterson, Darrell G., to University of Miami. Ophthalmological manikin with funduscopic eyeground presentation. 3,905,130, Cl. 35-17.000.

Gordon, Stanley I.: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,906,087.

Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., to Consolidation Coal Company. Removal of sulfur dioxide from gases containing sulfur dioxide and oxygen. 3,906,080, Cl. 423-242.000.

Gorlitz, Werner: *See—*
Fink, Peter; and Gorlitz, Werner, 3,905,302.

Gormley, William T., to Koppers Company, Inc. Preparation of fumarates. 3,905,943, Cl. 260-75.0UA.

Goronkin, Herbert, to General Electric Company. Field effect transistor devices and methods of making same. 3,906,541, Cl. 357-22.000.

Goshima, Yoshitomo: *See—*
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,905,697.

Gosswiller, Earl W.; Hsu, Dick T.; Williams, Richard H.; and Iacono, Joel G., to Federal Sign and Signal Corporation. Electronic alarm and emergency voice communication system. 3,906,491, Cl. 340-409.000.

Gotisar, Theodore H., to Aerojet-General Corporation. Closed-loop, precision-stop induction motor control circuit. 3,906,315, Cl. 318-212.000.

Gottwald, Ann: *See—*
Skidmore, Frank Oren, 3,905,648.

Govindarajan, Rangachari; Lobach, James L.; and Nichols, Kenneth E., to Sperry Rand Corporation. Geothermal energy pump thrust balance apparatus. 3,905,196, Cl. 60-641.000.

Goytisolo, Jorge Alberto; Chi, Donald Dongsuk; and Lee, Hanju, to W. R. Grace & Co. Process for producing zeolite X molecular sieve bodies. 3,906,076, Cl. 423-118.000.

Goza, Alva L.; Smith, Fay D.; Bentkowski, L. E.; Evans, Donald W.; Blake, Ronald P.; and Thompson, Jimmie L. Pressurized flush tank. 3,905,050, Cl. 4-28.000.

Gozdziewski, Charles. Toilet seat chair. 3,905,051, Cl. 4-134.000.

Graber, LeRoy D.: *See—*
Rigdon, James W.; Ifune, Saburo; and Graber, LeRoy D., 3,906,204.

Graham, John Robert, to Union Carbide Corporation. Tamperproof pouch label. 3,905,477, Cl. 206-459.000.

Graham, Robert C. Apparatus for processing printing plates precoated on both sides. 3,906,536, Cl. 354-319.000.

Grant, Munro M. Needle type inflation valve. 3,905,387, Cl. 137-223.000.

Gravicast Patentverwertungsge-Gesellschaft mbH: *See—*
Tenner, Oskar, 3,905,419.

Gray, Robert J., to Hodgman Manufacturing Co., Inc. Alarm check valve. 3,905,392, Cl. 137-557.000.

Green, Edward A.: *See—*
Johansen, Hans A.; Phillippi, Larry R.; and Green, Edward A., 3,905,398.

Green, Edwin Laurence. Steam trap. 3,905,385, Cl. 137-187.000.

Greenberg, Sanford D.: *See—*
Schiffman, Murray M., 3,906,384.

Greene, Clarence Kirk. Hydro-mechanical variable ratio transmission method and apparatus. 3,905,251, Cl. 74-687.000.

Greene Line Manufacturing Corporation: *See—*
Hoke, Kenneth E.; and Haynes, Gerald D., 3,905,487.

Greenleaf, Donald B.; and Smith, Dennis J., to Monroe Auto Equipment Company. Air adjustable shock absorber demonstration stand. 3,905,134, Cl. 35-49.000.

Greenwald, Harry; and Sherman, Perry, to Walter Kidde & Co., Inc. Coin box adapter for a coin controlled apparatus. 3,905,460, Cl. 194-1.00B.

Gregoli, Armand A.; and Hartos, George R., to Cities Service Research & Development Co. Process for reduction of high sulfur residue. 3,905,892, Cl. 208-95.000.

Gregory, Alvin L. Power plant. 3,905,195, Cl. 60-512.000.

Grenoble, Herebert E., to General Electric Company. Method of producing silicon-iron sheet material with boron addition and product. 3,905,842, Cl. 148-111.000.

Grether, Tobias H. A., to Cal-Turf, Inc. Seeding machine. 3,905,313, Cl. 111-1.000.

Greune, Christian; and Holzhauer, Hilbert, to Motoren- und Turbinen-Union Munchen GmbH. Apparatus for adjusting turbine guide vanes and the like. 3,905,720, Cl. 415-148.000.

Grevstad, Paul E.: *See—*
Parenti, Edmund K., Jr.; Bloomfield, David P.; Grevstad, Paul E.; and Beal, Daniel W., 3,905,884.

Griffin, Donald E.; Brown, Byron T.; and Williams, William H., to Phillips Petroleum Company. Fractionator column control system. 3,905,874, Cl. 203-1.000.

Grigorov, Ivaylo Yanev: *See—*
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Grimm, Maurice; and Vuilleumier, Maurice, to Ebauches S.A. Device for the electric connection between a display device of an electronic timepiece and the circuit controlling the said display device. 3,905,666, Cl. 339-17.00R.

Grinceri, Anthony. Supporting rack for sheet materials particularly carpet samples. 3,905,480, Cl. 211-45.000.

Grindheim, Earl A., to Rosemount Inc. Two wire current transmitter responsive to a resistance sensor input signal. 3,906,338, Cl. 323-75.00N.

Groendal, Bruce C. Jacket for canned beverages. 3,905,511, Cl. 220-90.200.

Grommes, Helmut; and Lehr, Willi, to Deutsche Babcock & Wilcox Aktiengesellschaft. Crushing roller mill protective method and system. 3,905,557, Cl. 241-30.000.

Gross, Alexander Louis; and Giese, Erik O., to Comfort Products, Inc. Heated insole construction. 3,906,185, Cl. 219-211.000.

Grossman, David G., to Corning Glass Works. Glass-ceramic articles with oriented mica crystals and method. 3,905,824, Cl. 106-39.600.

Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, to Siemens Aktiengesellschaft. Method and apparatus of signal conversion in program-controlled automatic data exchanges. 3,906,151, Cl. 178-3.000.

Grounds, Harry Cleveland: *See—*
Cherne, Lloyd G.; Grounds, Harry Cleveland; and Halvorson, Halvor O., 3,905,904.

Grove, Marvin H., to M & J Valve Company. Gate valve and method of manufacture. 3,905,082, Cl. 29-157.10R.

Grover, Derrick John, to National Research Development Corporation. Apparatus and methods for computer graphics. 3,906,197, Cl. 235-151.000.

Grubb, Willard T.: *See—*
Macur, Robert A.; LeBlanc, Oliver H., Jr.; and Grubb, Willard T., 3,905,889.

Grundig E.M.V. Electro-Mechanische Versuchsanstalt: *See—*
Mittelstaedt, Rainer, 3,906,299.

GTE Automatic Electric Laboratories Incorporated: *See—*
Brenski, Edwin F.; Draayer, Jan; Reynolds, Nigel J. E.; and Risky, Frank A., 3,906,163.
Dotter, Berton E., Jr., 3,906,174.
Heffner, Samuel T., 3,906,247.

GTE Laboratories Inc.: *See—*
Silver, H. Graham; Gardner, Phillip J.; Heller, Adam; and Argue, Gary R., 3,906,274.

GTE Sylvania Incorporated: *See—*
Doshi, Chandra P; and Pridmore, Lawrence W., 3,906,418.
Eckenbrecht, Robert Roy, 3,906,368.
Finch, William A.; Loughridge, Frederick A.; and Marcucci, Rudolf, 3,905,795.
Kelsey, Paul V., Jr.; and Mathers, James E., 3,905,911.
Mathers, James E., 3,905,912.
Smith, Charles W.; and Dyer, Mahlon D., 3,906,239.
Williams, G. Norman, 3,906,410.

Guadara, Joseph G.; and Wesserling, William R., to Sav-A-Life Corporation. Vehicle safety and crime deterrent communication system. 3,906,472, Cl. 340-224.000.

Guagliardo, John J.: *See—*
Mattedi, Bruno A.; and Guagliardo, John J., 3,906,457.

Guebert, Gerald E.; and Belknap, Raymond R. Drapery connector assembly. 3,905,414, Cl. 160-330.000.

Guenther, Ernst: *See—*
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, 3,905,946.

Guernet, Jacques; and Boissel, Pierre, to Compagnie d'Applications Micaniques a l'Electronique (CAMECA). X-ray spectrometer. 3,906,225, Cl. 250-272.000.

Guice, Daniel W. Protective cover. 3,906,170, Cl. 179-107.00R.

Gulf Research & Development Company: *See—*
Christman, Robert D.; Henke, Alfred M.; Paraskos, John A.; Wilson, Geoffrey R.; and Yanik, Stephen J., 3,905,893.

Gulyas, James W.; and Vydra, Charles, to Sherritt Gordon Mines Limited. Method for contact between fluids. 3,905,900, Cl. 210-20.000.

Gunther, Wolfgang H. H., to Xerox Corporation. Selenium compounds. 3,905,958, Cl. 260-239.00R.

Gupta, Mohan: *See—*
Brandwein, Rowland; and Gupta, Mohan, 3,906,437.

Guster, Allan; and Patterson, Jeffrey E., to Commonwealth of Australia, the Secretary Department of Supply, The. Tunnel searcher location and communication equipment. 3,906,504, Cl. 343-112.00R.

Gustin, Pol Ambroise Ghislain Joseph: *See—*
Schayes, Raymond Georges; Gustin, Pol Ambroise Ghislain Joseph; and Schmitz, Jean Fernand Raymond, 3,906,291.

Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., to Clark Equipment Company. Tree harvester. 3,905,407, Cl. 144-3.00D.

Guy, Kenneth Ronald; Dennis, Harry; and Hood, Robert Burns, to Rolls-Royce (1971) Limited. Fluid flow machines. 3,905,722, Cl. 416-193.000.

Guy, Michael G.; and Powers, Richard G., to Powers, Richard G.; Guy, Michael G.; Stern, James F.; and Stern, Robert M. Timed-release aspirin. 3,906,086, Cl. 424-20.000.

Haak, Eugene L.: *See—*
Menke, James A.; and Haak, Eugene L., 3,905,567.

Haas, Thomas W.; Mach, Richard L.; Studley, Edward; and Hoffman, Robert, to American Standard, Inc. Molding process. 3,906,072, Cl. 264-322.000.

Hach Chemical Company: *See—*
Hach, Clifford C., 3,905,768.

Hach, Clifford C., to Hach Chemical Company. Disposable weight burette and method for carrying out titrametric analyses. 3,905,768, Cl. 23-230.00R.

Haffner, Donald G.: *See—*
Akgulian, Sahag C.; Haffner, Donald G.; and Meyer, Dean A., 3,905,180.

Hagedorn, Floyd T.: *See—*
Reveils, Robert G.; Rahrig, Donald D.; and Hagedorn, Floyd T., 3,905,794.

Hagen, Richard D. Charged particle detector. 3,906,230, Cl. 250-336.000.

Hagendoorn, Joannes A.: *See—*
Crommentuyn, Gerardus J.; Hagendoorn, Joannes A.; and Knibbe, Hendrik, 3,905,814.

Hager, Clarence H., to Modern Caster Co., Inc. Stock rack with pivoted trays. 3,905,310, Cl. 108-111.000.

Hager, Robert Bonner; and Toukan, Sameeh Said, to Pennwalt Corporation. Fluorine and sulfur-containing compositions. 3,906,049, Cl. 260-609.00R.

Haglid, Frank Runar: *See—*
Gobeil, Richard John; and Haglid, Frank Runar, 3,905,973.

Haibara, Kenichiro, to Sony Corporation. Packing device. 3,905,474, Cl. 206-45.330.

Hale, Thomas F., to Capital Machine Company, Inc. Vacuum flitch table for veneer slicer. 3,905,408, Cl. 144-178.000.

Hall, J. Michael; and Clipp, Louis L., to Exotech, Incorporated. Apparatus for forming pulsed jets of liquid. 3,905,552, Cl. 239-101.000.

Hall, Jerry L.: *See—*
Jones, Robert D.; and Hall, Jerry L., 3,905,473.

Hallenbeck, Richard A.: *See—*
Labore, Walter T.; and Hallenbeck, Richard A., 3,905,325.

Halpern, John W. Proximity data transfer system with tamper proof portable data token. 3,906,460, Cl. 340-172.500.

Halvorson, Halvor O.: *See—*
Cherne, Lloyd G.; Grounds, Harry Cleveland; and Halvorson, Halvor O., 3,905,904.

Hamada, Yoichi: *See—*
Takahama, Sho; and Hamada, Yoichi, 3,906,535.

Hamilton, Billy Harold; Kunzinger, Frederick Francis; and La Porta, Frank Carl, to Bell Telephone Laboratories, Incorporated. DC to DC converter with linear pulse processing circuitry. 3,906,331, Cl. 321-2.000.

Hammann, Ingeborg: *See—*
Buchel, Karl Heinz; and Hammann, Ingeborg, 3,906,023.

Hammer, Hieme C. Method and apparatus for fabricating molded articles. 3,905,416, Cl. 164-132.000.

Hammond Corporation: *See—*
Schrecongost, Ray B., 3,905,447.

Hamsher, James J., to Pfizer Inc. Enzymatic deacylation of benzyl- and phenoxymethylpenicillin tetrazoles. 3,905,868, Cl. 195-36.00P.

Han, Grace Y.: *See—*
Carpino, Louis A.; and Han, Grace Y., 3,906,031.

Hanazono, Masanobu; and Asai, Osamu, to Hitachi, Ltd. Electrolytic etching method. 3,905,883, Cl. 204-129.650.

Hans Hirsch & Sohne Ohg Leder- und Kunststoffwarenfabrik: *See—*
Hirsch, Hermann, 3,905,046.

Hanusa, Helmut G., to Textron, Inc. Process for continuously producing foamed material of rectangular shape. 3,906,068, Cl. 264-51.000.

Harada, Masahiro; Takeda, Matsuyuki; Ichida, Mamoru; Nozaki, Shohei; and Miyahara, Kenji, to Matsushita Electric Industrial Co., Ltd. Dry cell. 3,905,834, Cl. 136-107.000.

Harakal, John J.: *See—*
Simon, Edward; Reisner, David B.; Ludwig, Bernard J.; Harakal, John J.; and Kletzkin, Milton, 3,905,977.

Harashino, Toshiko: *See—*
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.

Hardtmann, Goetz E., to Sandoz, Inc. Substituted tricyclic quinazolinones. 3,905,976, Cl. 260-256.40F.

Hardy, William C.: *See—*
Bradley, William S.; Hardy, William C.; and Lea, James F., Jr., 3,905,553.

Hareyama, Kyuichi; and Nakazawa, Shuzi, to Nippon Electric Company Limited. Matrix resistors for integrated circuit. 3,906,430, Cl. 338-320.000.

Hargrove, William W.: *See—*
Easton, Nelson R.; and Hargrove, William W., 3,906,028.

Harke, Cyril J.: *See—*
Eng, Jeffrey D.; and Harke, Cyril J., 3,905,879.

Harlan Mfg. Co., Inc.: *See—*
Ahlers, William H.; Derr, Robert E.; and Sahling, La Monte H., 3,905,523.

Harmon, Albert D.; Martin, Charles R.; and Drake, William H., to Saco-Lowell Corporation. Method and means for control of end-down servicing. 3,905,186, Cl. 57-34.00R.

Harmon, Albert D.; Martin, Charles R.; and Cleland, Luther A., Jr., to Saco-Lowell Corporation. Auxiliary yarn piecing equipment. 3,905,187, Cl. 57-34.00R.

Harmon, Richard C.: *See—*
Garretson, Oliver R.; and Harmon, Richard C., 3,905,098.

Harper, David C.; McCrobie, George L.; Price, Edgar E.; and Ritter, Joachim A., to Xerox Corporation. Zoom lens for fixed conjugates. 3,905,685, Cl. 350-184.000.

Harrington, Joseph Kenneth: *See*—
Moore, George G. I.; and Harrington, Joseph Kenneth, 3,906,024.

Harris Corporation: *See*—
Flutie, Richard E., 3,906,133.

Harris, Dennis K., to Fiber Industries, Inc. Drawing apparatus. 3,905,076, Cl. 28-71.300.

Harris-Intertype Corporation: *See*—
Phelan, Harry Richard, 3,906,514.

Harris, Lee B., to Xerox Corporation. Imaging process. 3,905,812, Cl. 96-1.300.

Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Terris, Barbara Zitko, to Sharps Associates. Heterocyclic esters of 5H-[1]benzopyrano[3,4-b]pyridines. 3,905,969, Cl. 260-247.20B.

Harris, Robert W., to United States of America, Navy. Pulse centroid detector. 3,906,377, Cl. 328-108.000.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 3,906,038.

Harrison, John, to Spra-Con Company, The. Conveyor loading and selective discharge system. 3,905,469, Cl. 198-38.000.

Harrison, John, to Spra-Con Company, The. Conveyor loading and coding system. 3,905,491, Cl. 214-11.00R.

Harrison, John R., to Westinghouse Air Brake Company. Modulated carrier transmitting circuit. 3,906,349, Cl. 325-105.000.

Hart, Kelly. Process and apparatus for producing animated films. 3,905,692, Cl. 352-52.000.

Hartnett, John J.; Cohen, Jules Barry; and Scordato, Emil A., to Medical Laboratory Automation, Inc. Apparatus for performing blood typing tests. 3,905,772, Cl. 23-259.000.

Hartos, George R.: *See*—
Gregoli, Armand A.; and Hartos, George R., 3,905,892.

Hartwig, Manfred, to G. L. Rexroth GmbH. Multiple-way hydraulic valve. 3,905,393, Cl. 137-596.140.

Harvey, Donald M., to Eastman Kodak Company. Method and apparatus for controlling exposure in artificial illumination. 3,906,516, Cl. 354-27.000.

Harvey Hubbell, Incorporated: *See*—
Carlson, Ernest Reinhold, 3,906,176.

Hasegawa, Akira; Yamaguchi, Yoshiharu; and Matsuda, Yoshio, to Yoshida Kogyo Kabushiki Kaisha. Sliding clasp fastener. 3,905,072, Cl. 24-205.16R.

Hasewend, Florian, to Gebr. Bohler & Co. Aktiengesellschaft. Earth boring method and apparatus. 3,905,431, Cl. 175-53.000.

Hashimoto, Shingo: *See*—
Nishikubo, Yasuhiko; Ebihara, Heihachiro; Hashimoto, Shingo; and Fukayama, Hiroyuki, 3,905,188.

Hashoff, Lothar; Luxa, Gunther; Thurk, Joachim; and Diessner, Armin, to Siemens Aktiengesellschaft. Insulator for high-voltage, metal-clad switching and transmission installations. 3,906,149, Cl. 174-167.000.

Haskell, Philip R., to Remington Arms Company, Inc. Firearm magazine follower. 3,905,142, Cl. 42-18.000.

Hatfield, James M.; and Donovan, Jeremiah J. Fireplace heat distribution unit. 3,905,351, Cl. 126-121.000.

Hattes, Neil R.: *See*—
Eyrick, Theodore B.; Brown, Allen C.; and Hattes, Neil R., 3,905,362.

Hattori, Shuzo; Eto, Mikio; Morino, Kenji; and Fujita, Tuyoshi, to Oriental Photo Industrial Co., Ltd.; and Kimmon Electric Co., Ltd. Recording method by photosensitive materials. 3,906,510, Cl. 346-1.000.

Hauck, Frederic Peter, to E. R. Squibb & Sons, Inc. Dihydroxy-tetrahydronaphthyoxyisobutyric acids and alkyl esters and salts thereof. 3,906,032, Cl. 260-473.00F.

Haugen, Haakon, to Texaco Inc. Lube oil containing oligomeric phosphorodiamidate. 3,905,908, Cl. 252-49.900.

Hauknes, Knut: *See*—
Alfarnes, Otto; and Hauknes, Knut, 3,905,647.

Haupt, Albert J. Engine warning device. 3,906,440, Cl. 340-52.00F.

Hausberg, Gerhard; Kruger, Georg; and Zentgraf, Karl-Martin, to G. Bischoff Bau Kompletter Gasreinigungs- und Wasserruckkuhlanlagen KG, Firma. Process for removing sulfur oxides from industrial waste gas. 3,906,078, Cl. 423-242.000.

Havera, Herbert John, to Miles Laboratories, Inc. N-benzyl-N-[2-phenyl-2-(4-phenyl-1-piperidyl)-ethyl]-propionamide parachlorobenzene sulfonate. 3,906,100, Cl. 424-267.000.

Havinga, Reginoldus; and Swaters, Pieter Dirk, to Koninklijke Industrieele Maatschappij Noury & van der Lande N.V. N,N'-bis(p-phenoxycarbophenyl)sulfondiamide. 3,906,029, Cl. 260-470.000.

Hawthorne, David Geoffrey, to Commonwealth Scientific and Industrial Research Organization. Coating particulates. 3,905,936, Cl. 260-40.00R.

Hayashi, Toyoshi: *See*—
Takeda, Nobuhiro; Yanagi, Osamu; Mizuno, Shigeo; and Hayashi, Toyoshi, 3,905,121.

Haynes, Gerald D.: *See*—
Hoke, Kenneth E.; and Haynes, Gerald D., 3,905,487.

Hazemeijer B.V.: *See*—
Brandhorst, Willem, 3,906,427.

Healy, Robert M. Resettable fuse. 3,906,422, Cl. 337-141.000.

Heavner, Larry W.; and Gidewall, Kenneth L., to Coronet Container. Process and apparatus for assembling a bulk container. 3,905,282, Cl. 93-36.00M.

Heffner, Samuel T., to GTE Automatic Electric Laboratories Incorporated. Programmable proportional clock edge delay circuit. 3,906,247, Cl. 307-293.000.

Hehl, Klaus Friedrich, to Illinois Tool Works Inc. One-piece fastening element. 3,905,270, Cl. 85-5.00R.

Heilman, Gerald D.; and Paddock, Gordon R., to General Motors Corporation. Air diverter valve and controlling means therefor. 3,905,193, Cl. 60-290.000.

Heinzelmann, Karl-Georg: *See*—
Conrad, Bernhard; and Heinzelmann, Karl-Georg, 3,906,234.

Heisler, Raymond. Manually manipulated apparatus and method of peripherally securing a plastic cover to a rimmed open top container. 3,905,174, Cl. 53-38.000.

Helffer, Bernard: *See*—
Raisin, Jean-Pierre; and Helffer, Bernard, 3,905,211.

Heller, Adam: *See*—
Silver, H. Graham; Gardner, Phillip J.; Heller, Adam; and Argue, Gary R., 3,906,274.

Hellerbach, Joseph; and Zanetti, Guido, to Hoffmann-La Roche Inc. (2-Aminobenzophenone) acetonitriles. 3,906,025, Cl. 260-465.00E.

Hemrich, William R.: *See*—
Churas, Algerd C.; and Hemrich, William R., 3,905,379.

Hemsath, Klaus H.; and Vereecke, Frank J., to Midland-Ross Corporation. Gas burner. 3,905,751, Cl. 431-183.000.

Hendricks, Udo-Winfried; and Walz, Klaus, to Bayer Aktiengesellschaft. Diphosphonate esters having dicarbamic acid diesters. 3,906,063, Cl. 260-932.000.

Hendrickson, Melvin C., to Zenith Radio Corporation. Varactor tuning system. 3,906,373, Cl. 325-468.000.

Henke, Alfred M.: *See*—
Christman, Robert D.; Henke, Alfred M.; Paraskos, John A.; Wilson, Geoffrey R.; and Yanik, Stephen J., 3,905,893.

Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Thiolesters of 3,7,11-trimethyldodeca-2,4,11-trienoic acid. 3,906,020, Cl. 260-455.00R.

Henriques, Frank Fini, to RCA Corporation. Fault detection facilitating means for card reader of identification card reading system. 3,906,448, Cl. 340-149.00A.

Henry, David W.; and Sturm, Priscilla A., to Stanford Research Institute. Diazabicyclooctanes and diazabicycloheptanes. 3,905,979, Cl. 260-268.0BF.

Henry, Richard Dale. Apparatus and process for continuously monitoring the depth and location of standing water on aircraft runways and the like. 3,905,236, Cl. 73-304.00R.

Henry Simon Limited: *See*—
Johnson, Frederick Paul, 3,905,490.

Hercules Incorporated: *See*—
Boardman, Harold; and Wagner, Richard L., 3,905,816.
Irwin, Philip G.; McNaughtan, Thomas J.; and Roberts, Joseph G., 3,905,935.
Kim, Charles W.; Liu, Chia-Seng; and Logan, Lawrence J., Jr., 3,906,073.

Herrmann, Manfred: *See*—
Satzinger, Gerhard; and Herrmann, Manfred, 3,905,978.

Herzog, Michael. Bottle capping machine. 3,905,177, Cl. 53-314.000.

Herzog, Rollie R., to Construction Materials, a division of General Electric Company. Retrofit emergency lighting system. 3,906,243, Cl. 307-66.000.

Hess, Hans-Jurgen Ernst: *See*—
Dominy, Beryl William; Hess, Hans-Jurgen Ernst; and Koch, Richard Carl, 3,905,800.

Hess, Richard F., to United States of America, Air Force. Signal retaining analog integrator apparatus. 3,906,214, Cl. 235-183.000.

Hewlett-Packard GmbH: *See*—
Hupe, Klaus Peter, 3,905,395.

Hewson, John R.; and Hewson, Roy H., to Brunswick Mfg. Co., Inc. Apparatus for sealing the esophagus and providing artificial respiration and evacuating the stomach. 3,905,361, Cl. 128-145.500.

Hewson, Roy H.: *See*—
Hewson, John R.; and Hewson, Roy H., 3,905,361.

Heymes, Rene: *See*—
Martel, Jacques; and Heymes, Rene, 3,905,965.

Hibino, Masahiro; Ito, Toshio; Iwamoto, Masatami; Nomura, Ikuko; and Kishimoto, Fukutaro, to Mitsubishi Denki Kabushiki Kaisha. Induction heating apparatus for minimizing vibration and noise. 3,906,181, Cl. 219-10.490.

Hibl, Joseph J.; and Sutton, Harold E., to Beech Aircraft Corporation. Cryogenic tank support system. 3,905,508, Cl. 220-15.000.

Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, to Meiji Seika Co., Ltd. Bacillopeptidase C, a new alkaline protease and its production by cultivating bacillus bacteria. 3,905,869, Cl. 195-62.000.

Higgs, William York, to Intercontinental Marine Limited. Anchoring device for buoyant life saving equipment. 3,905,060, Cl. 9-9.000.

Higo, Akio: *See*—
Okuno, Yoshitoshi; Toyoura, Akira; and Higo, Akio, 3,906,089.

Hikai, Akio; Kobayashi, Yoshiyuki; and Furuta, Kazuyoshi, to Nippon Kokan Kabushiki Kaisha. Clamping mechanism for platform. 3,905,572, Cl. 248-242.000.

Hilleman, Maurice R.; Tytell, Alfred A.; and Woodhour, Allen F., to Merck & Co., Inc. Stimulation of antibody response. 3,906,092, Cl. 424-89.000.

Hills, William H.: *See*—
Trifunovic, Alexander L.; and Hills, William H., 3,905,560.

Hilsinger Corporation, The: *See*—
Whiting, Harold F.; and Nelson, Herbert P., 3,905,085.
Himmler, Gunther; and Ohms, Klaus-Peter, to Gebr. Hofmann KG. Vibration measuring pickup. 3,905,224, Cl. 73-71.300.
Hines, Norman: *See*—
Laterra, Salvatore, 3,905,481.
Hinrichsen, Eric N., to General Electric Company. Strip temperature control system. 3,905,216, Cl. 72-13.000.
Hirafuji, Van: *See*—
Sawada, Hideo; Hirafuji, Van; and Komada, Kenya, 3,905,332.
Hirakawa, Tamotsu: *See*—
Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, 3,905,866.
Hirao, Kenichi, to Fuji Electric Company Ltd. Shaft rotation responsive stopping means for a motor-driven chuck. 3,906,322, Cl. 318-464.000.
Hiraoka, Yukio; Nakao, Sadao; and Noda, Yoshinobu, to Dainichi-Nippon Cables, Ltd. Insulated wire. 3,906,139, Cl. 428-383.000.
Hirohashi, Toshiyuki: *See*—
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, 3,906,003.
Hirosawa, Toshio: *See*—
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.
Hirota, Takeo: *See*—
Kaiho, Yasuharu; and Hirota, Takeo, 3,905,437.
Hirsch, Hermann, to Hans Hirsch & Sohne Ohg Leder- und Kunststoffwarenfabrik. Laminated strap with decorative stitching. 3,905,046, Cl. 2-338.000.
Hiskens, Ian Richard: *See*—
Dowthwaite, Edwin; and Hiskens, Ian Richard, 3,906,142.
Hitachi, Ltd.: *See*—
Hanazono, Masanobu; and Asai, Osamu, 3,905,883.
Ishida, Isao; and Kitano, Yutaka, 3,905,657.
Kanai, Hiromi; Watanabe, Kiyoshi; and Yamazaki, Eiichi, 3,905,079.
Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, 3,906,165.
Narita, Hiroshi, 3,906,317.
Takahashi, Naoki; Taneda, Yukinori; and Kobayashi, Takashi, 3,905,862.
Watanabe, Atsumi; Amano, Hisao; and Isono, Akira, 3,906,335.
Hobart Corporation: *See*—
Engebretsen, Einar O., 3,905,289.
Rogers, Robert M., 3,906,208.
Hochstein-Mintzel, Volker: *See*—
Stickl, Helmut; and Hochstein-Mintzel, Volker, 3,905,371.
Hodgman Manufacturing Co., Inc.: *See*—
Gray, Robert J., 3,905,392.
Hodson, Harold F.; and Batchelor, John Frederick, to Burroughs Wellcome Co. (Tetrazolyl)thioxanthone-10,10-dioxides. 3,905,989, Cl. 260-308.00D.
Hoechst Aktiengesellschaft: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,905,764.
Franz, Raimund; and Duwel, Dieter, 3,906,034.
Frass, Werner, 3,905,820.
Lehinant, Armand; and Maier, Hans-Peter, 3,905,762.
Rassbach, Felix; Buttner, Rolf; and Schuck, Stephan, 3,905,066.
Schroter, Herbert; and Dennhardt, Werner, 3,905,698.
Winkelmann, Erhardt; and Raether, Wolfgang, 3,905,985.
Hoegberg, Ruth G.; and Tyler, Walter S. Recovery of oil and oil-soluble contaminants from the surface of water. 3,905,902, Cl. 210-30.000.
Hoerauf, Werner: *See*—
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, 3,905,946.
Hoeschele, David F., Jr.; and Barnes, Eugene H., to General Electric Company. Digital echo suppressor. 3,906,172, Cl. 179-170.600.
Hoeschele, David F., Jr.; and Berger, Gerald B., to General Electric Company. Method and apparatus for error correction in a digital data transmission system. 3,906,367, Cl. 325-38.00B.
Hoetzel, John H. Dice game. 3,905,603, Cl. 273-138.00R.
Hofer, Kurt; Moesch, Rudolf; Schilli, Alfred; and Burdet, Evelyne, to Sandoz Ltd. Oxalic acid derivatives. 3,906,041, Cl. 260-558.00S.
Hoffman, Robert: *See*—
Haas, Thomas W.; Mach, Richard L.; Studley, Edward; and Hoffman, Robert, 3,906,072.
Hoffman, William B. Auxiliary bicycle brake arrangement. 3,905,242, Cl. 74-480.00R.
Hoffmann-La Roche Inc.: *See*—
Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, 3,906,006.
Coffen, David Llewellyn; and Fryer, Rodney I., 3,906,001.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 3,905,956.
Dostert, Philippe; and Kyburz, Emilio, 3,905,972.
Hellerbach, Joseph; and Zanetti, Guido, 3,906,025.
Metlesics, Werner; and Sternbach, Leo Henryk, 3,905,994.
Mindt, Wolfgang; and Fehlmann, Willy, 3,905,888.
Perry, Clark William, 3,906,004.
Surmatis, Joseph Donald; and Walser, Armin, 3,906,047.
Hofmann, John E.: *See*—
Riley, Kenneth L.; House, William T.; and Hofmann, John E., 3,905,916.
Hofmeister, Helmut: *See*—
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.
Hogue, Noel E.: *See*—
Dennison, Charles M.; and Hogue, Noel E., 3,906,375.
Hohmann, Walter: *See*—
Reubke, Karl-Julius; Hohmann, Walter; and Bien, Hans-Samuel, 3,906,013.
Hoke, Kenneth E.; and Haynes, Gerald D., to Greene Line Manufacturing Corporation. Continuous stacking apparatus. 3,905,487, Cl. 214-6.00H.
Holan, George, to Commonwealth Scientific and Industrial Research Organization. Process for the preparation of cis-8-dodecen-1-ol acetate. 3,906,035, Cl. 260-491.000.
Holdsworth, Robert S.; Billings, Charles A.; and O'Neill, Gerald J., to W. R. Grace & Co. Dichlorofluoromethylcyclopropanes. 3,906,052, Cl. 260-648.00F.
Holkeboer, Ronald E.: *See*—
Cairo, Anthony C.; and Holkeboer, Ronald E., 3,905,748.
Holley, Myle J., Jr. Footed dolphins. 3,905,199, Cl. 61-46.000.
Hollins, Brian E., to National Semiconductor Corporation. Metal-silicide Schottky diode employing an aluminum connector. 3,906,540, Cl. 357-15.000.
Hollmann, Walter G.; and Newlin, Harry O., to Teledyne, Inc. Drawing board. 3,906,127, Cl. 428-73.000.
Holm, Pekka, to Valmet Oy. Paper-finishing calenders. 3,905,288, Cl. 100-162.00R.
Holmqvist, Per Goran; and Eliasson, Lars Erik Bertil, to AB Braas Spegelindustri. Rearview mirror capable of being dimmed. 3,905,687, Cl. 350-281.000.
Holzhauer, Hilbert: *See*—
Greune, Christian; and Holzhauer, Hilbert, 3,905,720.
Homeyer, Arthur C.: *See*—
Dreibelbis, Richard C.; Homeyer, Arthur C.; and Turner, Warren E., 3,905,518.
Hommel, Ernest Mayer: *See*—
Carini, George Francis; Hommel, Ernest Mayer; and Twigger, James Raymond, 3,906,124.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Miura, Kimio, 3,905,439.
Okada, Motohiro; and Omori, Taiji, 3,905,440.
Honeywell Inc.: *See*—
McCracken, William Lynn, 3,905,675.
Patrick, Ian M., 3,905,483.
Stauffer, Norman L., 3,906,219.
Togo, Masaaki; and Takeuchi, Nobuo, 3,905,229.
Honeywell Information Systems, Inc.: *See*—
Sullivan, James F., 3,906,309.
Hong, Se J.; and Ostapko, Daniel L., to International Business Machines Corporation. Data coding circuits for encoded waveform with constrained charge accumulation. 3,906,485, Cl. 340-347.0DD.
Hongu, Masayuki; and Ikeda, Isamu, to Sony Corporation. Transistor amplifier circuits with stabilized low current biasing. 3,906,386, Cl. 330-22.000.
Hood, Robert Burns: *See*—
Guy, Kenneth Ronald; Dennis, Harry; and Hood, Robert Burns, 3,905,722.
Hoogendijk, Adrianus Huibert, to U.S. Philips Corporation. Apparatus for reading a disc-shaped record carrier. 3,906,152, Cl. 178-6.70A.
Hooker Chemicals & Plastics Corporation: *See*—
Eng, Jeffrey D.; and Harke, Cyril J., 3,905,879.
Hooper, David William, to Global Marine Inc. Heave compensator. 3,905,580, Cl. 254-172.000.
Hopla, Doyle L. Traffic control system for converging lanes, such as when boarding a ski lift. 3,906,439, Cl. 340-44.000.
Hornung, Walter, to Daimler-Benz Aktiengesellschaft. Brake installation for motor vehicles, especially for buses. 3,905,651, Cl. 303-2.000.
Horsfield, David, to Universal Oil Products Company. Back supports. 3,905,058, Cl. 5-337.000.
Horton, Laurence Henry; and Batey, Peter Harvey, to English Electric Valve Company Limited. Camera tube mesh clamped between dished annular members. 3,906,278, Cl. 313-383.000.
Horvath, Miklos B.: *See*—
Housman, William A.; and Horvath, Miklos B., 3,906,201.
Hosoe, Kazuya: *See*—
Matsumoto, Seiichi; and Hosoe, Kazuya, 3,906,389.
Hosokoshi, Kakuichiro; and Yoshida, Osamu, to Matsushita Electronics Corporation. Apparatus and method of manufacturing color picture tubes. 3,906,515, Cl. 354-1.000.
Houdaille Industries, Inc.: *See*—
Cantrell, Ronald G., 3,905,630.
Houldcroft, Peter T., to Welding Institute, The. Storage tanks and methods of manufacturing such tanks. 3,905,092, Cl. 228-173.000.
House, William T.: *See*—
Riley, Kenneth L.; House, William T.; and Hofmann, John E., 3,905,916.
Housman, William A.; and Horvath, Miklos B., to Housman, William A. Module card verification system. 3,906,201, Cl. 235-61.70B.
Houston, George B.; and Simonsen, Roger H., to Boeing Computer Services, Inc. Associative memory device. 3,906,455, Cl. 340-172.500.
Hover, Alexander: *See*—
Schneider, Ernst; Simon, Manfred; Weiss, Richard; Hover, Alexander; and Treutler, Christian, 3,906,065.

Hoverter, Bryce E., Jr.: *See—*
Wenrich, Carl M.; and Hoverter, Bryce E., Jr., 3,906,328.
Howa Kogyo Kabushiki Kaisha: *See—*
Takai, Satoshi; Izutsu, Seiji; Iida, Shigenobu; and Terao, Osamu, 3,905,184.
Hoyle, William; and Savage, Michael Philip, to Ciba-Geigy Corporation. Pharmaceutical compositions containing substituted 5-nitrofurfurylideneamino-oxazolidinones. 3,906,101, Cl. 424-272.000.
Hrboticky, Karel: *See—*
Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, 3,905,646.
Hruza, Denis E.: *See—*
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., 3,906,119.
Hsu, Dick T.: *See—*
Gosswiller, Earl W.; Hsu, Dick T.; Williams, Richard H.; and Iacono, Joel G., 3,906,491.
Hubner, Otto. Collapsible garment dryer. 3,905,125, Cl. 34-151.000.
Hubner, Werner, to Sulzer-Ksb Kernkraftwerkspumpen GmbH. Face seal. 3,905,605, Cl. 277-22.000.
Hudson, Harold G.; and Brandiff, Ray. Electrolytic zinc salvaging method. 3,905,882, Cl. 204-119.000.
Huettemann, Erik W. Building wall unit. 3,905,170, Cl. 52-593.000.
Huffman, John W.: *See—*
Clancy, Raymond W.; and Huffman, John W., 3,906,424.
Hughes Aircraft Company: *See—*
Gallagher, Hayden E.; and Knauer, Wolfgang, 3,906,270.
Lind, Harold V.; and Frey, Gary D., 3,906,411.
Hughes, Nigel: *See—*
Berrie, Alistair Howard; and Hughes, Nigel, 3,905,951.
Hughes Tool Company: *See—*
Mullins, John M., 3,905,432.
Hukki, Risto Tapani, to Murskauskone Oy. Apparatus for wet fine screening. 3,905,894, Cl. 209-17.000.
Hunt, Delbert E., to TRW Inc. Metallized film capacitor and method of manufacture thereof. 3,906,297, Cl. 317-258.000.
Hunter, John M., to United States of America, Navy. Precision time interval comparator. 3,906,346, Cl. 324-186.000.
Hunter, Richard H.: *See—*
Schowalter, Kenneth A.; and Hunter, Richard H., 3,905,805.
Hupe, Klaus Peter, to Hewlett-Packard GmbH. Mixing chamber. 3,905,395, Cl. 137-604.000.
Hy-Way Heat Systems, Inc.: *See—*
Miller, William F., 3,905,752.
Hycom Incorporated: *See—*
Motley, David M.; and Cheng, King Y., 3,906,347.
Hyler, John H., to Westinghouse Air Brake Company. Ground supported elevator in elevating type scraper. 3,905,136, Cl. 37-8.000.
Hyogo Prefectural Government: *See—*
Dohi, Nobuyasu; and Kamon, Mikio, 3,905,878.
I.D. Inc.: *See—*
Adams, John Q.; and Adams, David, 3,905,595.
I-T-E Imperial Corporation: *See—*
Clausing, Challis I., 3,906,413.
Iacono, Joel G.: *See—*
Gosswiller, Earl W.; Hsu, Dick T.; Williams, Richard H.; and Iacono, Joel G., 3,906,491.
Iannazzi, Fred D.; Rafferty, John W.; Sparrow, Donald B.; and Strauss, Richard, to Arthur D. Little, Inc. Process for dry forming paper. 3,906,064, Cl. 264-24.000.
Ichida, Mamoru: *See—*
Harada, Masahiro; Takeda, Matsuyuki; Ichida, Mamoru; Nozaki, Shohei; and Miyahara, Kenji, 3,905,834.
ICI United States Inc.: *See—*
Wyhof, John R., 3,905,813.
ICN Tracerlab N.V.: *See—*
Knulst, Benjamin Jacobus, 3,905,482.
Ifune, Saburo: *See—*
Rigdon, James W.; Ifune, Saburo; and Graber, LeRoy D., 3,906,204.
Igarashi, Hiroshi; Kawaguchi, Toshiyuki; and Sakanishi, Kenji, to NGK Insulators Ltd. Pilot insulator for detecting degree of contamination thereof. 3,905,240, Cl. 73-432.0SD.
Iida, Shigenobu: *See—*
Takai, Satoshi; Izutsu, Seiji; Iida, Shigenobu; and Terao, Osamu, 3,905,184.
Iijima, Taizo; and Mori, Kenichi, to Iijima, Taizo; and Tokyo Shibaura Electric Co., Ltd. Pattern identification system. 3,906,446, Cl. 340-146.3MA.
Iikuni, Tetsuo: *See—*
Nakazawa, Hideaki; Iikuni, Tetsuo; and Akashi, Mitsumasa, 3,905,932.
Ikari, Eiichi: *See—*
Enoki, Kichiji; Yao, Toshio; Ishimitsu, Keiichi; Tsukashima, Keiichi; and Ikari, Eiichi, 3,905,995.
Ikeda, Isamu: *See—*
Hongu, Masayuki; and Ikeda, Isamu, 3,906,386.
Ikeda, Kikuo: *See—*
Mukai, Kunihiko; and Ikeda, Kikuo, 3,905,852.
Ikegami, Takemi: *See—*
Tsurumi, Takashi; Emori, Shuichi; Daigoh, Kiyokazu; Ikegami, Takemi; and Kaneko, Tutomu, 3,906,130.
Ikemori, Masayuki: *See—*
Watanabe, Yusaku; Ikemori, Masayuki; and Kitakata, Tuneharu, 3,905,568.
Illinois Tool Works Inc.: *See—*
Andersen, Stephen Verner; and Swick, Edwin Grant, 3,905,318.
Breckenfelder, Alvin Herman, 3,905,246.
Hehl, Klaus Friedrich, 3,905,270.
Stiefvater, Clarence Kurt, 3,906,312.
Illman, Walter F.: *See—*
Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., 3,905,928.
Imai, Hideyo: *See—*
Akahane, Fumitake; Iwakawa, Tsunekiyo; Imai, Hideyo; Okazaki, Hiroshi; and Wada, Toshio, 3,906,286.
Imanaga, Kojiro: *See—*
Saida, Youichi; Ito, Hajime; and Imanaga, Kojiro, 3,905,275.
Imperial Chemical Industries Limited: *See—*
Barlow, Charles Brian; White, Brian Graham; and Tomlin, Clive Dudley Spencer, 3,906,098.
Barrie, Ian Torrance, 3,906,066.
Berrie, Alistair Howard; and Hughes, Nigel, 3,905,951.
Burling, Eric Douglas; and Steel, Margaret Lilian, 3,906,128.
Colchester, John Edward; and Blundell, Thomas, 3,905,986.
Crabtree, Allen, 3,905,950.
Krause, Janusz Josef Henryk; and Denton, David Alan, 3,906,122.
Lee, Denis; and Norburn, Leslie, 3,905,880.
Snell, Brian Kenneth, 3,906,094.
Imperial Metal Industries (Kynoch) Limited: *See—*
Barber, Anthony Clifford, 3,905,828.
Inaba, Shigeho: *See—*
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, 3,906,003.
Inagaki, Takeo: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,906,016.
Inamoto, Yoshiaki: *See—*
Aigami, Koji; and Inamoto, Yoshiaki, 3,906,044.
Industrial Nucleonics Corporation: *See—*
Fowler, Ronald James; and Freeh, Edward James, 3,905,123.
Spitz, David Allan, 3,906,196.
Industrie Pirelli S.p.A.: *See—*
Marocco, Sergio, 3,905,412.
Ing. C. Olivetti & C., S.p.A.: *See—*
Salmon, Marion, 3,906,325.
Ingenjorsfirman Nilcon AB: *See—*
Nilsson, Sven Melker, 3,906,069.
Ingersoll-Rand Company: *See—*
Black, Arthur Lowell, 3,905,713.
Ingrip Fasteners, Inc.: *See—*
Brumlik, George C., 3,905,071.
Ingvar Valentin Falk: *See—*
Persson, Bror Arthur, 3,905,450.
Innocenti Santeustacchio S.p.A.: *See—*
Galletti, Cesare, 3,905,218.
Inomata, Yuji: *See—*
Tanida, Kikuo; Teraoka, Kenro; and Inomata, Yuji, 3,906,251.
Institut de Recherches de la Siderurgie Francaise: *See—*
Boillot, Pierre, 3,905,222.
Instituto Mexicano del Petroleo: *See—*
Ordonez, Raul Poblano; Rosado, Antonio Acuna; Petrirena, Francisco Garaicochea; and Rivera de Campos, Edith, 3,905,826.
Intercontinental Marine Limited: *See—*
Higgs, William York, 3,905,060.
Intereko S. A.: *See—*
Ghelfi, Fiovanni, 3,905,796.
Interlake, Inc.: *See—*
McConnell, Kennedy, 3,905,712.
International Business Machines Corporation: *See—*
Anderson, Clifford W.; Castrodale, Daniel O.; and Martin, Jerry T., 3,906,141.
Ash, Eric Albert, 3,906,432.
Hong, Se J.; and Ostapko, Daniel L., 3,906,485.
Lane, Ralph D.; and Manning, Richard A., 3,906,254.
Matisoo, Juri; and Zappe, Hans H., 3,906,538.
Nussbaumer, Henri J., 3,906,218.
Polischuk-Sawtschenko, Alexander, 3,906,153.
Schwartz, Alfred Alexander; and Stewart, Joseph Robert, 3,906,480.
Simonetti, Alexander, 3,905,841.
Voegeli, Otto, 3,906,468.
International Flavors & Fragrances Inc.: *See—*
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., 3,906,119.
International Harvester Company: *See—*
Tamburino, James C.; and Zaborsky, George, 3,905,616.
International Paper Company: *See—*
Lazdowski, John P., 3,905,370.
International Presspack Company: *See—*
Friedrich, Richard; and Rindelaub, Frank A. E., 3,905,517.
International Standard Electric Corporation: *See—*
Bakka, Raymond, 3,906,209.
Bissinger, Norbert, 3,906,419.
International Telephone and Telegraph Corporation: *See—*
Anhalt, John W.; and Curley, James H., 3,905,670.
Anhalt, John W.; Goodman, David S.; and Burns, Edgar, 3,905,672.
Apps, David John, 3,906,370.
Aptt, Harry W., Jr., 3,906,271.
November, Milton H., 3,906,198.
Richardson, Henry Allan; and Sellari, Daniele, Jr., 3,906,365.

Intraco, Inc.: *See*—
Jones, Robert D.; and Hall, Jerry L., 3,905,473.
Intreprinderea Industriala de Stat Methalothehnica: *See*—
Sandor, Vasile; and Kolozsvari, Zoltan, 3,905,771.
Irie, Seiji: *See*—
Shichida, Hiromichi; Toyoda, Kenichi; and Irie, Seiji, 3,906,262.
Irwin, Arthur S.: *See*—
United States of America, National Aeronautics and Space Administration; and Irwin, Arthur S., 3,905,660.
Irwin, Philip G.; McNaughtan, Thomas J.; and Roberts, Joseph G., to Hercules Incorporated. Dye laking resins for printing inks. 3,905,935, Cl. 260-33.20R.
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Method of preparing esters of carboxylic acids. 3,906,016, Cl. 260-410.90R.
Ise Electronics Corporation: *See*—
Tanji, Mikiharu, 3,906,269.
Iseda, Yutaka; Kitayama, Motozumi; Odaka, Fumio; and Anzai, Shiro, to Bridgestone Tire Company Limited. Preparation of oxazolidone polymers in the presence of a magnesium halide/phosphine oxide complex. 3,905,945, Cl. 260-77.50R.
Ishida, Isao; and Kitano, Yutaka, to Hitachi, Ltd. Lubricated vertical thrust bearing. 3,905,657, Cl. 308-73.000.
Ishii, Haruo; Urano, Fumio; Kawasaki, Masahiro; and Mochizuki, Toshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter screen assembly for a focal plane shutter. 3,906,531, Cl. 354-242.000.
Ishii, Kazuo: *See*—
Yoshikawa, Motohiko; Shimizu, Yoshiaki; Tanaka, Yoshiharu; and Ishii, Kazuo, 3,905,964.
Ishikawa, Haruhiko: *See*—
Ohshima, Iwao; Chiba, Seiichi; Shibuya, Yukio; and Ishikawa, Haruhiko, 3,905,122.
Ishimitsu, Keiichi: *See*—
Enoki, Kichiji; Yao, Toshio; Ishimitsu, Keiichi; Tsukashima, Keiichi; and Ikari, Eiichi, 3,905,995.
Ishizu, Akira: *See*—
Mitsui, Kotaro; Ishizu, Akira; and Susaki, Wataru, 3,905,704.
Ismert, Theodore J. Cushion maintaining device for water service lines. 3,905,357, Cl. 138-26.000.
Isono, Akira: *See*—
Watanabe, Atsumi; Amano, Hisao; and Isono, Akira, 3,906,335.
Itani, Takashi: *See*—
Moriyama, Inao; Itani, Takashi; and Takahashi, Kiyoshi, 3,905,693.
Itek Corporation: *See*—
Feinleib, Julius; and Lipson, Stephen G., 3,906,462.
Ito, Hajime: *See*—
Saida, Youichi; Ito, Hajime; and Imanaga, Kojiro, 3,905,275.
Ito, Hikaru. Bath for treating aluminum and aluminum alloys to form oxide film nonelectrolytically thereon and method for the treatment. 3,905,838, Cl. 148-6.270.
Ito, Toshio: *See*—
Hibino, Masahiro; Ito, Toshio; Iwamoto, Masatami; Nomura, Ikuko; and Kishimoto, Fukutaro, 3,906,181.
Itoh, Yoshio; Itsukaichi, Yoshitoshi; and Kuroi, Fumiaki, to Sankyo Organic Chemicals Co., Ltd. Stabilization of rigid polyvinyl chloride resin composition. 3,905,933, Cl. 260-31.600.
Itsukaichi, Yoshitoshi: *See*—
Itoh, Yoshio; Itsukaichi, Yoshitoshi; and Kuroi, Fumiaki, 3,905,933.
ITT Industries, Inc.: *See*—
Keller, Hans, 3,906,332.
IVAC Corporation: *See*—
Knute, Wallace L., 3,905,232.
O'Leary, Stephen H.; and Melton, Paul J., 3,905,905.
Ivanov, Alexandr Karlovich: *See*—
Vlasov, Pavel Semenovich; Ivanov, Alexandr Karlovich; Svechnikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich, 3,905,546.
Ivanov, Georgi Iliev: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.
Ivas, Thomas W., to Quasar Electronics Corporation. Noise immunity circuit for use with remote control receiver. 3,906,257, Cl. 307-231.000.
Ivas, Thomas Wayne, to Quasar Electronics Corporation. Gate-actuated on/off control for television receivers. 3,906,150, Cl. 178-7.30R.
Ives, Marion P.: *See*—
Caylor, Henry J.; and Ives, Marion P., 3,905,632.
Iwakami, Takuya, to Nippon Electric Company, Limited. Two-port network for signal transmission equalization. 3,906,406, Cl. 333-18.000.
Iwakawa, Tsunekiyo: *See*—
Akahane, Fumitake; Iwakawa, Tsunekiyo; Imai, Hideyo; Okazaki, Hiroshi; and Wada, Toshio, 3,906,286.
Iwamoto, Masatami: *See*—
Hibino, Masahiro; Ito, Toshio; Iwamoto, Masatami; Nomura, Ikuko; and Kishimoto, Fukutaro, 3,906,181.
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.
Iwase, Koichi; Saito, Takahiko; and Tanaka, Schosuke, to Sony Corporation. Combined phonograph record player and magnetic tape recorder for recording on tape the content of a phonograph record. 3,906,169, Cl. 179-100.10A.
Iwatsu Electric Co., Ltd.: *See*—
Fujioka, Koichiro; and Tano, Takeo, 3,905,811.
Izutsu, Seiji: *See*—
Takai, Satoshi; Izutsu, Seiji; Iida, Shigenobu; and Terao, Osamu, 3,905,184.
Izzo, Patrick Thomas: *See*—
Tomcuecik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, 3,905,974.
J. E. Love Company: *See*—
Moore, Paul J.; and Neal, Archie E., 3,905,183.
J.I.L. Corporation of America, Inc.: *See*—
Tsuji, Tom T., 3,906,371.
Jackson, Carl D. Hydraulic stabilizer for limiting movement. 3,905,425, Cl. 172-321.000.
Jackson, Edward L. Process and apparatus for reclamation of abrasive grit. 3,905,898, Cl. 209-444.000.
Jackson, Harry L.; and Boyd, Harry R., to Mountain States Telephone & Telegraph Company. Method and apparatus for sorting and distributing mail. 3,905,896, Cl. 209-124.000.
Jackson, Richard D.: *See*—
Carroll, Wallace E.; and Jackson, Richard D., 3,905,769.
Jacob, Carlyle W. Refrigeration and water condensate removal apparatus. 3,905,203, Cl. 62-272.000.
Jacob, Joseph. Dental health tool and method of disrupting plaque. 3,905,113, Cl. 32-40.00R.
Jacobi, Otto K., to Kolmar Laboratories, Inc. Material for the physiological treatment and refatting of human skin. 3,906,106, Cl. 424-312.000.
Jacobsen Manufacturing Company: *See*—
Akgulian, Sahag C.; Haffner, Donald G.; and Meyer, Dean A., 3,905,180.
Jacobson, Wayne D., to Simplicity Engineering Company. Material classifying apparatus. 3,905,897, Cl. 209-405.000.
Jacuzzi Bros., Incorporated: *See*—
Jacuzzi, Virgil, 3,905,358.
Jacuzzi, Virgil, to Jacuzzi Bros., Incorporated. Hydro-air fitting. 3,905,358, Cl. 128-66.000.
Jahn, Arnold. System for collecting and transferring usable solar heat. 3,905,352, Cl. 126-270.000.
Janes, John R., to Standard Oil Company, The. Convertible rail-highway mine car. 3,905,306, Cl. 105-215.00C.
Jansa, Milos; Bezdek, Miloslav; and Spisiak, Juraj, to Vyzkumny a vyvojovy ustav Avodu vseobecneho strojirenstvi. Arrangement for distribution of a pressure medium in a jet loom. 3,905,402, Cl. 139-127.00P.
Japanese National Railways: *See*—
Watanabe, Yusaku; Ikemori, Masayuki; and Kitakata, Tuneharu, 3,905,568.
Yatagai, Shukuro; and Tamura, Katunori, 3,905,494.
Jarman, Alonzo B.: *See*—
Zeuner, Kenneth W.; and Jarman, Alonzo B., 3,905,575.
Jasper, Joseph C.; and Pierson, Marvin B., to Armco Steel Corporation. Oxidation-resistant low alloy steel with Al coating. 3,905,780, Cl. 29-196.200.
Jeffree, Samuel J., to Burroughs Corporation. Folding photo-electric detecting device. 3,906,240, Cl. 250-571.000.
Jeppson, Morris R. Method for the preparation of precooked meat products. 3,906,115, Cl. 426-243.000.
Jerde, James B., to Digital Dynamics, Inc. Flow control system. 3,905,394, Cl. 137-599.000.
Jeumont-Schneider: *See*—
Wiart, Albert, 3,906,314.
Jin, Katsuyuki: *See*—
Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, 3,906,165.
Joel, Amos Edward, Jr., to Bell Telephone Laboratories, Incorporated. Multiple link nodal switching network. 3,906,175, Cl. 179-18.0GE.
Joerns Furniture Company: *See*—
Carpentier, John H., 3,905,311.
Johansen, Hans A.; Phillippi, Larry R.; and Green, Edward A., to Samuel Moore & Company. Composite reinforced hose wherein the reinforcing material is braided aromatic polyamide filaments. 3,905,398, Cl. 138-124.000.
Johansson, Leif A. T.; and Pers, Nils G., to Tipe Revent AB. Oven for baking food products. 3,905,760, Cl. 432-176.000.
John Wyeth & Brother Limited: *See*—
Archibald, John Leheup, 3,905,961.
Johncock, Allan W.: *See*—
Wright, Robert M.; and Johncock, Allan W., 3,905,873.
Johns-Manville Corporation: *See*—
Coombs, Garth; Butterworth, Elbert Roy; and Bell, George Richard, 3,905,910.
Painter, John B., 3,905,090.
Johnson, Amos N.; and Gilbert, Richard D., to Johnson, Amos N. Pedicure prosthesis for the metatarsal arch of the foot. 3,905,376, Cl. 128-595.000.
Johnson, Bobby Dean, to United States of America, Army. Munition destruct apparatus. 3,905,272, Cl. 89-1.00R.

Johnson, Bruce K., to Polaroid Corporation. Photographic composing aid enclosed within a camera handle. 3,906,528, Cl. 354-162.000.
Johnson, Charles A. Oil condition indicator. 3,905,702, Cl. 356-70.000.
Johnson, Frederick Paul, to Henry Simon Limited. Case-making machinery. 3,905,490, Cl. 214-6.00D.
Johnson & Johnson: *See*—
Felty, Lanny G., 3,906,108.
Kyte, James M., 3,905,369.
Johnson, Lewis T., to Phillips Petroleum Company. Tray. 3,905,510, Cl. 220-83.000.
Johnson, Melvin L.; and Shawver, Bruce M., to United States of America, Energy Research and Development Administration. Quick release latch for reactor scram. 3,905,634, Cl. 294-86.00A.
Johnson, Paul H.: *See*—
Evans, James P., 3,905,255.
Johnson, Richard I.: *See*—
Thornburg, David D.; and Johnson, Richard I., 3,906,537.
Johnson, Roger L., to VEDA, Inc. Pump apparatus. 3,905,725, Cl. 417-231.000.
Johnston, Mack S., to Draft Systems, Inc. Keg tapping device. 3,905,522, Cl. 222-400.700.
Jones, David Thomas; Rees, Kenneth Rowland; and Jowett, George Edward, to Viscose Development Company Limited. Activated cellulose. 3,905,954, Cl. 260-212.000.
Jones, John P.; and Stirling, Ronald C., to Sperry Rand Corporation. Direct-type binary frequency synthesizer for microwave frequencies. 3,906,388, Cl. 331-39.000.
Jones, Robert D.; and Hall, Jerry L., to Intraco, Inc. Drive apparatus. 3,905,473, Cl. 198-208.000.
Jones, Robert J., to TRW Inc. Polyquinoxalines and method of preparation. 3,905,941, Cl. 260-47.0UA.
Jordan, Ernest R.: *See*—
Jordan, Glen L., 3,905,421.
Jordan, Glen L., to Jordan, Ernest R.; McCartney, Jack D., Jr.; and McGueyer, James C. Well gravelling tool. 3,905,421, Cl. 166-51.000.
Jorgensen, Gary D., to Albany International Corporation. Humidifier filter. 3,905,786, Cl. 55-230.000.
Joseph Bancroft & Sons Co.: *See*—
Trifunovic, Alexander L.; and Hills, William H., 3,905,560.
Joseph Lucas (Industries) Limited: *See*—
Cooksey, William Harold, 3,905,095.
Jos. Schlitz Brewing Company: *See*—
Larson, Robert M.; and Gabos, Theodore D., 3,905,488.
Jowett, George Edward: *See*—
Jones, David Thomas; Rees, Kenneth Rowland; and Jowett, George Edward, 3,905,954.
Judy, Kenneth: *See*—
Weiss, Charles M.; and Judy, Kenneth, 3,905,108.
Jung, Johann: *See*—
Zeeh, Bernd; Jung, Johann; Rentzea, Costin; and Koenig, Karl-Heinz, 3,905,798.
Jurewicz, Anthony T.; Young, Lewis Brewster; and Chu, Chin-Chiun. V-P-Zr catalysts and method of preparation thereof. 3,905,914, Cl. 252-437.000.
Juszak, Joseph J.; and Absler, Howard K., to Uarco Incorporated. Continuous forms assembly. 3,905,545, Cl. 229-69.000.
Kabushiki Kaisha Kito: *See*—
Maeda, Kazuo; and Tsubokawa, Masakatsu, 3,905,492.
Kabushiki Kaisha Suehiro Sharyo Seisakusho: *See*—
Yokoyama, Masato, 3,905,620.
Kabushiki Kaisha Suwa Seikosha: *See*—
Kasai, Yoshihiko, 3,905,835.
Oguchi, Kikuo, 3,906,260.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kuwako, Tomohisa; and Tanase, Tosio, 3,906,264.
Takeda, Nobuhiro; Yanagi, Osamu; Mizuno, Shigeo; and Hayashi, Toyoshi, 3,905,121.
Kabushiki Kaisha U. M. I.: *See*—
Kaiho, Yasuharu; and Hirota, Takeo, 3,905,437.
Kacere, Joseph A., to Raymond Lee Organization, Inc., The, a part interest. Amphibious vehicle. 3,905,323, Cl. 115-1.00R.
Kaeding, Warren W.; and Butter, Stephen A., to Mobil Oil Corporation. Alkylation of olefins. 3,906,054, Cl. 260-683.430.
Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased (by Pierce, Martha Murphy, executrix), to American Can Company. Method of providing a labeled side-seamed can body. 3,905,854, Cl. 156-212.000.
Kaiho, Yasuharu; and Hirota, Takeo, to Kabushiki Kaisha U. M. I. Electrically drivable wheelchair. 3,905,437, Cl. 180-15.000.
Kain's Research and Development Company, Inc.: *See*—
Smith, Ennis Dean, 3,905,637.
Kaiser Aluminum & Chemical Corporation: *See*—
Gibbs, Francis E.; and Dempsey, John J., 3,906,184.
Kaiser, Edward William; and Rentmeester, Kenneth Richard, to American Can Company. Can body. 3,906,126, Cl. 428-36.000.
Kaiser, Heinz W. Rotatable building structure. 3,905,166, Cl. 52-65.000.
Kalmanash, Michael H., to United Aircraft Corporation. Low cost switching high voltage supply. 3,906,333, Cl. 323-17.000.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'Oreal. Composition and method for dyeing keratinous fibers. 3,905,761, Cl. 8-10.200.
Kaminski, Walter R.: *See*—
Pierce, Robert M.; Smith, Philip W.; and Kaminski, Walter R., 3,905,192.
Kamon, Mikio: *See*—
Dohi, Nobuyasu; and Kamon, Mikio, 3,905,878.
Kanai, Hiromi; Watanabe, Kiyoshi; and Yamazaki, Eiichi, to Hitachi, Ltd. Method of manufacturing color selective electrode for color picture tube of black matrix type or the like type. 3,905,079, Cl. 29-25.170.
Kaneda, Toshiyuki: *See*—
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.
Kanegafuchi Chemical Industries: *See*—
Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, 3,905,866.
Kaneko, Tutomu: *See*—
Tsurumi, Takashi; Emori, Shuichi; Daigoh, Kiyokazu; Ikegami, Takemi; and Kaneko, Tutomu, 3,906,130.
Kaneno, Masayuki: *See*—
Kobayashi, Kazuo; and Kaneno, Masayuki, 3,905,845.
Kangol Magnet Limited: *See*—
Kell, John, 3,905,562.
Kao Soap Co., Ltd.: *See*—
Aigami, Koji; and Inamoto, Yoshiaki, 3,906,044.
Kapp, Gerald J. Nasal air filter. 3,905,335, Cl. 128-140.00N.
Karchak, Andrew, Jr.; and Allen, James R., to Wheelchairs, Inc. Adjustable wheelchair. 3,905,436, Cl. 180-6.500.
Karl Kroyer St. Anne's Limited: *See*—
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 3,905,864.
Karpenko, Anatole N., to Anchor/Darling Valve Company. Valve. 3,905,577, Cl. 251-357.000.
Kasai, Yoshihiko, to Kabushiki Kaisha Suwa Seikosha. Alkali button battery. 3,905,835, Cl. 136-111.000.
Kassat, Harry: *See*—
Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, 3,905,420.
Katayama, Hajime: *See*—
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,905,697.
Kawaguchi, Toshiyuki: *See*—
Igarashi, Hiroshi; Kawaguchi, Toshiyuki; and Sakanishi, Kenji, 3,905,240.
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, to Sony Corporation. Loudspeaker. 3,905,448, Cl. 181-172.000.
Kawamata, Kiyoshi, to Nihon Seikan Kabushiki Kaisha. Ball marker holder for golf. 3,905,525, Cl. 224-5.00C.
Kawasaki, Masahiro: *See*—
Ishii, Haruo; Urano, Fumio; Kawasaki, Masahiro; and Mochizuki, Toshio, 3,906,531.
Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha. Method and apparatus for controlling the brakes of vehicles. 3,905,441, Cl. 180-98.000.
Keib, Heinz; and Schlachter, Fredo, to Glaswerk Schuller GmbH. Apparatus for making a non-woven web from synthetic fibers. 3,905,067, Cl. 19-156.000.
Kelch, Heinz; Kirchgessner, Hilmar; and Schuh, Eduard, to Kienzle Apparate GmbH. Tape carrier. 3,905,561, Cl. 242-71.800.
Kelemen, Jozsef W., to Leigh Instruments Limited. Cassette scratch strain recorder. 3,906,511, Cl. 346-7.000.
Kell, John, to Kangol Magnet Limited. Vehicle safety belt retractors. 3,905,562, Cl. 242-107.400.
Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., to Corporation of Gonzaga University, The. Method for removing pollutants from combustion products generated by hydrocarbon fuel combustion, and system therefor. 3,905,784, Cl. 55-31.000.
Keller, Hans, to ITT Industries, Inc. Integrated circuit current supply. 3,906,332, Cl. 323-4.000.
Kelly, Emmett J.: *See*—
Smith, Leonard R.; and Kelly, Emmett J., 3,905,155.
Kelsey-Hayes Company: *See*—
Bertolasi, Robert B., 3,906,345.
Tribe, Leonard T., 3,905,654.
Kelsey, Paul V., Jr.; and Mathers, James E., to GTE Sylvania Incorporated. Copper activated hafnium phosphate phosphors and method of making. 3,905,911, Cl. 252-301.40P.
Kennametal Inc.: *See*—
Woodward, Bruce C., 3,905,744.
Kennecott Copper Corporation: *See*—
Spreckelmeyer, Bernhard W., 3,906,074.
Kennedy, James D.: *See*—
Lindner, Henry; and Kennedy, James D., 3,905,677.
Kenney, Lindel D. Safety valve apparatus for rotary drilling equipment. 3,905,427, Cl. 173-12.000.
Keprta, Buran I., Jr.: *See*—
Verma, Jugal K.; and Keprta, Buran I., Jr., 3,906,506.
Kern, Peter: *See*—
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.
Kerr-McGee Chemical Corporation: *See*—
Rado, Theodore A.; and Nelson, Thomas C., 3,906,077.
Kerr, William J.: *See*—
Clark, Dennis E.; and Kerr, William J., 3,905,960.

Kerschbaum, Arthur P.: *See*—
Cruse, Clyde L., Jr.; and Kerschbaum, Arthur P., 3,905,806.
Kesling, Peter C. Orthodontic tying attachment. 3,905,111, Cl. 32-14.00A.
Keszthelyi, Csaba Peter: *See*—
Bard, Allen J.; and Keszthelyi, Csaba Peter, 3,906,283.
Kettel, Hans: *See*—
Thumm, Helmut; and Kettel, Hans, 3,905,257.
Khanna, R. T., to Du Pont de Nemours, E. I., and Company. Color concentrates. 3,905,937, Cl. 260-40.00R.
Kidd, Alan Lister; Eaves, Douglas; and Walmsley, Keith, to Dorman Smith Switchgear Limited. Electric circuit breakers. 3,906,414, Cl. 335-42.000.
Kieburtz, Robert Bruce; and Mina, Kent Vincent, to Bell Telephone Laboratories, Incorporated. Digital filter circuit. 3,906,199, Cl. 235-152.000.
Kienzle Apparate GmbH: *See*—
Kelch, Heinz; Kirchgessner, Hilmar; and Schuh, Eduard, 3,905,561.
Kienzle Uhrenfabriken G.m.b.H.: *See*—
Siefert, Roland; Seckinger, Hans; and Krosche, Herbert, 3,905,189.
Kiess, Helmut Gustav, to RCA Corporation. Apparatus for copying an electrostatic charge pattern in intensified form. 3,906,501, Cl. 346-74.0ES.
Killion, Thomas W.: *See*—
Kleine, Richard E.; and Killion, Thomas W., 3,905,100.
Kilmer, John B. Gerotor type fluid motor, pump or the like. 3,905,727, Cl. 418-61.00B.
Kim, Charles W.; Liu, Chia-Seng; and Logan, Lawrence J., Jr., to Hercules Incorporated. Methods of making network structures. 3,906,073, Cl. 264-147.000.
Kimberly-Clark Corporation: *See*—
Spencer, Harvey J.; and Wittkopf, Eugene W., 3,905,592.
Kimmon Electric Co., Ltd.: *See*—
Hattori, Shuzo; Eto, Mikio; Morino, Kenji; and Fujita, Tuyoshi, 3,906,510.
Kimura, Tsuguo; Soga, Setsuo; and Watanabe, Toshio, to Ricoh Co., Ltd. Means for precluding trailing of toner images in electrophotography of the wet type. 3,905,331, Cl. 118-637.000.
King Radio Corporation: *See*—
Rodgers, Daniel L.; and Cater, Thomas F., 3,906,420.
Kingsbury, Frederick J.: *See*—
Clearwaters, Walter L.; Kingsbury, Frederick J.; Shippey, Carlyle E., Jr.; and Soderberg, John W., 3,906,431.
Kinley, Myron M. Wireline operated tubing detector. 3,905,227, Cl. 73-151.000.
Kinoshita, Hideaki: *See*—
Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, 3,905,866.
Kirchgessner, Hilmar: *See*—
Kelch, Heinz; Kirchgessner, Hilmar; and Schuh, Eduard, 3,905,561.
Kirev, Kiril Spassov: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.
Kirino, Osamu: *See*—
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.
Kishimoto, Fukutaro: *See*—
Hibino, Masahiro; Ito, Toshio; Iwamoto, Masatami; Nomura, Ikuko; and Kishimoto, Fukutaro, 3,906,181.
Kissel, Ernst: *See*—
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, 3,905,946.
Kitakata, Tuneharu: *See*—
Watanabe, Yusaku; Ikemori, Masayuki; and Kitakata, Tuneharu, 3,905,568.
Kitano, Yutaka: *See*—
Ishida, Isao; and Kitano, Yutaka, 3,905,657.
Kitayama, Motozumi: *See*—
Iseda, Yutaka; Kitayama, Motozumi; Odaka, Fumio; and Anzai, Shiro, 3,905,945.
Kiyonaga, Yasuhiro: *See*—
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,906,016.
Kjellberg, Leif Roland; Riise, Kjell; and Svensson, Per-Olov, to Telefonaktiebolaget LM Ericsson. Device for providing a controlled retardation of a winding machine. 3,906,318, Cl. 318-269.000.
Kjellstrom, Alvar Eskil Petrus, to AB Broderna Kjellstrom. Ski binding. 3,905,612, Cl. 280-11.35B.
Klacza, Robert E.: *See*—
Andersen, Poul H.; and Klacza, Robert E., 3,906,441.
Kleiber, Joseph P., to Tropel, Inc. Lens making method. 3,905,163, Cl. 51-284.000.
Klein, Andrew R., trustee: *See*—
Brooks, Ralph J., 3,905,454.
Klein, Gerald B. Sealant for pushdown gate in a can lid. 3,905,513, Cl. 220-268.000.
Klein, Schanzlin and Becker Aktiengesellschaft: *See*—
Florjancic, Dusan, 3,905,606.
Kleine, Richard E.; and Killion, Thomas W. Carpet cutter guide. 3,905,100, Cl. 30-124.000.
Kletzkin, Milton: *See*—
Simon, Edward; Reisner, David B.; Ludwig, Bernard J.; Harakal, John J.; and Kletzkin, Milton, 3,905,977.
Klug, James H., to Minnesota Mining and Manufacturing Company. Poly (urea-urethane) foams containing immobilized active enzymes. 3,905,923, Cl. 260-2.5AD.
Klutchko, Sylvester; and von Strandtmann, Maximilan, to Warner-Lambert Company. 3-Nitrochromones. 3,906,005, Cl. 260-345.200.
Knauer, Wolfgang: *See*—
Gallagher, Hayden E.; and Knauer, Wolfgang, 3,906,270.
Kneisel, Joseph P. Roof flashings for use with roof planking. 3,905,165, Cl. 52-58.000.
Knell, Martin: *See*—
Dexter, Martin; and Knell, Martin, 3,905,939.
Knibbe, Hendrik: *See*—
Crommentuyn, Gerardus J.; Hagendoorn, Joannes A.; and Knibbe, Hendrik, 3,905,814.
Knifton, John F.; and Suggitt, Robert M., to Texaco Inc. Homogeneous ruthenium catalysts useful in the selective reduction of nitroaromatics to amines. 3,906,045, Cl. 260-580.000.
Knodle, John P.: *See*—
Brooks, Walter G.; and Knodle, John P., 3,905,773.
Knoll A.G. Chemische Fabriken: *See*—
Ehrmann, Oskar; Zimmermann, Frank; and Friedrich, Ludwig, 3,905,990.
Knulst, Benjamin Jacobus, to ICN Tracerlab N.V. Casing for holding sample tubes. 3,905,482, Cl. 211-74.000.
Knute, Wallace L., to IVAC Corporation. Electronic thermometer. 3,905,232, Cl. 73-362.0AR.
Kobayakawa, Masaki; and Yawata, Kazufumi, to Nippon Electric Kagoshima, Ltd. Luminescent display tube anode assembly comprising anode segments each having a tungsten carbide conductive layer. 3,906,285, Cl. 313-496.000.
Kobayashi, Kazuo; and Kaneno, Masayuki, to NGK Insulators. Translucent alumina containing magnesia yttria and lanthium oxide. 3,905,845, Cl. 106-62.000.
Kobayashi, Tadaki: *See*—
Mino, Hiroshi; Sasatani, Tadashi; and Kobayashi, Tadaki, 3,905,217.
Kobayashi, Takashi: *See*—
Takahashi, Naoki; Taneda, Yukinori; and Kobayashi, Takashi, 3,905,862.
Kobayashi, Yoshinobu: *See*—
Kurauchi, Noritaka; Yoshida, Kenichi; Kobayashi, Yoshinobu; and Kuroda, Masataka, 3,906,436.
Kobayashi, Yoshiyuki: *See*—
Hikai, Akio; Kobayashi, Yoshiyuki; and Furuta, Kazuyoshi, 3,905,572.
Kobe Steel, Ltd.: *See*—
Nishimura, Shojiro; and Yonehara, Masanori, 3,905,428.
Kobori, Toshio; and Sumita, Toru, to Minolta Camera Kabushiki Kaisha. Mechanical exposure time control mechanism for use in a focal plane shutter for photographic camera. 3,906,518, Cl. 354-51.000.
Kobori, Toshio: *See*—
Kuramoto, Yoshio; Kobori, Toshio; and Ueda, Hiroshi, 3,906,532.
Koch, Richard Carl: *See*—
Dominy, Beryl William; Hess, Hans-Jurgen Ernst; and Koch, Richard Carl, 3,905,800.
Kochanowski, John E.: *See*—
Takekoshi, Tohru; and Kochanowski, John E., 3,905,942.
Kodama, Hayashi: *See*—
Tomita, Tamaki; and Kodama, Hayashi, 3,905,161.
Koeda, Takemi: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.
Koenig, Karl-Heinz: *See*—
Zeeh, Bernd; Jung, Johann; Rentzea, Costin; and Koenig, Karl-Heinz, 3,905,798.
Kohnert, Dietrich, to Siemens Aktiengesellschaft. System for monitoring traffic conditions in connection with the control thereof. 3,906,438, Cl. 340-38.00R.
Koivunen, Erkki A.: *See*—
Week, Nils P.; Shellman, Carl E.; and Koivunen, Erkki A., 3,905,274.
Koizumi, Masami; and Yamauchi, Satoshi, to Ricoh Co., Ltd. Teaching system. 3,905,128, Cl. 35-8.00A.
Kokubu, Kozo: *See*—
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.
Kolb, Clarence B., Jr.: *See*—
Sparlin, Derry D.; and Kolb, Clarence B., Jr., 3,905,423.
Kolb, Karl Heinz: *See*—
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.
Kolenda, Herbert: *See*—
Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, 3,905,420.
Kolmar Laboratories, Inc.: *See*—
Jacobi, Otto K., 3,906,106.
Koloskov, Vladimir Vasilievich: *See*—
Vlasov, Pavel Semenovich; Ivanov, Alexandr Karlovich; Svech-

nikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich, 3,905,546.

Kolozsvari, Zoltan: *See*—
Sandor, Vasile; and Kolozsvari, Zoltan, 3,905,771.

Kolwey, Herman Gopp. Tilt axis dual rotor helicopter and control system. 3,905,565, Cl. 244-17.230.

Komada, Kenya: *See*—
Sawada, Hideo; Hirafuji, Van; and Komada, Kenya, 3,905,332.

Kommrusch, Richard S., to Motorola, Inc. Tunable antenna coupling circuit. 3,906,405, Cl. 333-17.00M.

Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Duplex copying apparatus. 3,905,697, Cl. 355-26.000.

Kompa, Karl L.; Gensel, Peter; and Wanner, Jochen. Optical molecular amplifyer. 3,906,395, Cl. 331-94.50G.

Konda, Kichiro, to Denyo Kagaku Kogyo Kabushiki Kaisha. Method of preventing formation of harmful combustion gases in combustion furnace. 3,905,745, Cl. 431-2.000.

Kondo, Tokiharu, deceased: *See*—
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,905,821.

Kondo, Yoshiharu, legal representative: *See*—
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,905,821.

Koninklijke Industrieele Maatschappij Noury & van der Lande N.V.: *See*—
Havinga, Reginoldus; and Swaters, Pieter Dirk, 3,906,029.

Koppers Company, Inc.: *See*—
Gormley, William T., 3,905,943.

Korudanov, Georgi Nikolov: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Kosono, Kazuhiro; and Kosono, Yasukazu. Wheels for roller skates and the like. 3,905,649, Cl. 301-5.700.

Kosono, Yasukazu: *See*—
Kosono, Kazuhiro; and Kosono, Yasukazu, 3,905,649.

Kotick, Michael Paul; Patel, Chimanbhai P.; Colbourn, Joseph L.; and Erickson, Robert J., to Miles Laboratories, Inc. Poly-5-halogeno-2′-halogeno-2′-deoxyuridylic acids. 3,905,953, Cl. 260-211.50R.

Kotter, Karl-Heinz: *See*—
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.

Kotting, Wolfgang, to Steuler Industriewerke G.m.b.H. Apparatus for the removal of malodorous components from gases. 3,905,774, Cl. 23-283.000.

Kozlowski, Joseph M., to Bendix Corporation, The. Two electrode spark gap apparatus. 3,906,273, Cl. 313-220.000.

Krackhardt, Elliott M.; and Nolan, William J., to General Electric Company. Precision getter alignment for cathode ray tubes. 3,906,282, Cl. 313-481.000.

Krambeck, Robert Harold; Smith, George Elwood; and Strain, Robert Joseph, to Bell Telephone Laboratories, Incorporated. Conductively connected charge coupled devices. 3,906,542, Cl. 357-24.000.

Krassas, James G.: *See*—
Campbell, Glenn M.; and Krassas, James G., 3,905,285.

Kratos: *See*—
Smalarz, Anthony A.; and Yule, Roger T., 3,905,237.

Krause, Janusz Josef Henryk; and Denton, David Alan, to Imperial Chemical Industries Limited. Method for coating metal anodes with electroconductive paint. 3,906,122, Cl. 427-33.000.

Kriedt, Hans: *See*—
Schatter, Eckart; and Kriedt, Hans, 3,906,372.

Kronig, Walter; and Schwerdtel, Wulf, to Bayer Aktiengesellschaft. Process for the purification of crude liquid vinyl acetate. 3,905,875, Cl. 203-71.000.

Kronk, Richard Eugene, to Combustion Engineering, Inc. Magnetic-electric position sensor. 3,906,469, Cl. 340-188.00R.

Krosche, Herbert: *See*—
Siefert, Roland; Seckinger, Hans; and Krosche, Herbert, 3,905,189.

Kruger, Georg: *See*—
Hausberg, Gerhard; Kruger, Georg; and Zentgraf, Karl-Martin, 3,906,078.

Krutak, James J., Sr., to Eastman Kodak Company. Synthesis of 2,3-substituted indoles. 3,905,999, Cl. 260-319.100.

Krutzel, Lawrence, to Air Products and Chemicals, Inc. Water resistant adhesive. 3,906,135, Cl. 428-246.000.

Kubomatsu, Teruo: *See*—
Yoshida, Hiroshi; Sasai, Kazuyoshi; and Kubomatsu, Teruo, 3,906,046.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Thin film deposition method using segmented plasma. 3,905,887, Cl. 204-192.000.

Kuether, Christian L.: *See*—
Decker, Thomas A.; Kuether, Christian L.; Williams, Robert E.; and Logar, Noel D., 3,905,688.

Kuhlman Corporation: *See*—
Smith, Woodrow Wilson; and Youngquist, David Jack, 3,905,403.

Kukolja, Stjepan P.; and Lammert, Steven R., to Eli Lilly and Company. Cephalosporin cleavage process. 3,905,966, Cl. 260-243.00C.

Kuleg Kuhlmobelfabrik & Apparatebau GmbH: *See*—
Deubel, Karl; Weber, Willi; and Schuchmann, Dieter, 3,905,206.

Kulik, Metro D.: *See*—
Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., 3,906,080.

Kumamoto, Satosi: *See*—
Manabe, Takao; and Kumamoto, Satosi, 3,906,356.

Kumano, Hiroshi: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; Kumano, Hiroshi; and Noguchi, Yoshinori, 3,905,917.

Kume, Yoshiharu: *See*—
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, 3,906,003.

Kung, Joseph T.: *See*—
Amason, Myron P.; and Kung, Joseph T., 3,906,308.

Kunkel, Donald H.; and Seymour, Donald E. Algaecide and herbicide composition. 3,905,797, Cl. 71-66.000.

Kunzinger, Frederick Francis: *See*—
Hamilton, Billy Harold; Kunzinger, Frederick Francis; and La Porta, Frank Carl, 3,906,331.

Kupfert, Bernard F.: *See*—
Maguire, Roy L.; Kupfert, Bernard F.; and Whitehurst, Gerald E., 3,905,607.

Kurahashi, Koichiro; and Tottori, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Display apparatus. 3,906,290, Cl. 315-169.00R.

Kuramoto, Yoshio; Kobori, Toshio; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Apparatus for preventing abnormal camera operation. 3,906,532, Cl. 354-258.000.

Kuraray Co., Ltd.: *See*—
Ueeda, Ryuhei, 3,906,008.

Kurauchi, Noritaka; Yoshida, Kenichi; Kobayashi, Yoshinobu; and Kuroda, Masataka, to Sumitomo Electric Industries, Ltd. Detection system for the location of moving objects. 3,906,436, Cl. 340-23.000.

Kurei, Hiroshi: *See*—
Nomura, Katsuhiko; Urano, Fumio; and Kurei, Hiroshi, 3,906,517.

Kurimura, Yasuo; Furutani, Yoshio; Makiguchi, Nobuyoshi; and Souda, Kenji, to Mitsui Toatsu Chemicals, Incorporated. Method of producing L-lysine by fermentation. 3,905,867, Cl. 195-28.00R.

Kuroda, Masataka: *See*—
Kurauchi, Noritaka; Yoshida, Kenichi; Kobayashi, Yoshinobu; and Kuroda, Masataka, 3,906,436.

Kuroi, Fumiaki: *See*—
Itoh, Yoshio; Itsukaichi, Yoshitoshi; and Kuroi, Fumiaki, 3,905,933.

Kushlefsky, Bernard G.; and Whitney, Wendell K., to M & T Chemicals Inc.; and Dow Chemical Company, The. Pesticidal composition and method. 3,906,103, Cl. 424-288.000.

Kutzbach, Carl; and Schmidt-Kastner, Gunther, to Bayer Aktiengesellschaft. Purification of kallikrein. 3,905,870, Cl. 195-62.000.

Kuwabara, Motosuke: *See*—
Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, 3,906,165.

Kuwako, Tomohisa; and Tanase, Tosio, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Rotor vibration suppressing apparatus for miniature electric motors. 3,906,264, Cl. 310-51.000.

Kwong, Luen, to Raymond Lee Organization, Inc., The, a part interest. Impact reducer for vehicles. 3,905,629, Cl. 293-24.000.

Kyburz, Emilio: *See*—
Dostert, Philippe; and Kyburz, Emilio, 3,905,972.

Kyte, James M., to Johnson & Johnson. Diaper with adhesive tabs. 3,905,369, Cl. 128-287.000.

La Cellophane: *See*—
Charles-Messance, Francois; and Collobert, Ernest, 3,905,583.

Labore, Walter T.; and Hallenbeck, Richard A., to Pitney-Bowes, Inc. Envelope flap moistening apparatus. 3,905,325, Cl. 118-7.000.

Lackore, James Kneeland, to PPG Industries, Inc. Lamp mounting bracket. 3,906,217, Cl. 240-51.110.

La Clair, Louis M.: *See*—
Coveney, Joseph F.; and La Clair, Louis M., 3,905,201.

Lacroix, Roger, to Comptoir Lyon-Alemand-Louyot. Composite and porous metallic members which can be used for bone prosthesis. 3,905,777, Cl. 29-183.500.

Laftsidis, Stergios: *See*—
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,906,114.

Laitram Corporation, The: *See*—
Lapeyre, Fernand S., 3,905,471.

Lajovic, Dusan S., to Colgate-Palmolive Company. Method of protectively covering metal threads. 3,906,070, Cl. 264-159.000.

Lake, James Douglas. Method and apparatus for conducting audiometric tests. 3,906,158, Cl. 179-1.00N.*

Lam, Hing-Yat: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, 3,906,014.

Lamb, James A.: *See*—
Beckmann, Robert M.; Lamb, James A.; Nieglos, Donald J.; and Reynolds, Gary R., 3,906,445.

Lambermont, John: *See*—
Shoot, Lyle E.; and Lambermont, John, 3,906,311.

Lambert, Earl Abee: *See*—
Bounous, Daniel Barthlemy; and Lambert, Earl Abee, 3,905,212.

Lambrou, Andreas: *See*—
Quesnel, Peter Gregory; Lambrou, Andreas; and Walker, Edwin Stanley, 3,906,116.

Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., to American Petroscience Corporation. Telemetering system for oil wells. 3,906,434, Cl. 340-18.0NC.

Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., to American Petroscience Corporation. Oil well telemetering system with torsional transducer. 3,906,435, Cl. 340-18.0NC.

Lamkemeyer, Klaus, to Mertens & Co. Kommanditgesellschaft. Saddle. 3,905,643, Cl. 297-195.000.

Lammert, Steven R.: *See—*
Kukolja, Stjepan P.; and Lammert, Steven R., 3,905,966.

Lamoureux, Andre, to Thomson-CSF. Electron beam deflection circuit including thyristors. 3,906,306, Cl. 315-408.000.

Lamparth, Fritz: *See—*
Seeger, Walter; and Lamparth, Fritz, 3,905,065.

Lancaster, Raymond L., to Lanson Industries, Inc. Latch assembly. 3,905,628, Cl. 292-257.000.

Lane, Ralph D.; and Manning, Richard A., to International Business Machines Corporation. Complementary FET pulse level converter. 3,906,254, Cl. 307-205.000.

Lange, Gerhard, to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid. Chain welding machine. 3,906,182, Cl. 219-51.000.

Lange, Gerhard, to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid. Chain welding machine. 3,906,183, Cl. 219-51.000.

Lange, Gottfried, to Siemens Aktiengesellschaft. X-ray photographic process. 3,906,228, Cl. 250-315.000.

Langenbach, Erwin, to Erwinsick Optik-elektronik. Reflector plate. 3,905,679, Cl. 350-103.000.

Lanier, Carroll W., to Ethyl Corporation. Process for the production of olefins. 3,906,053, Cl. 260-683.15D.

Lanson Industries, Inc.: *See—*
Lancaster, Raymond L., 3,905,628.

Lapeyre, Fernand S., to Laitram Corporation, The. Shrimp dry feeder mechanism. 3,905,471, Cl. 198-161.000.

Lapeyronnie, Andre Gabriel, to FIME. Electronic ignition device for internal combustion engines. 3,905,347, Cl. 123-148.00E.

La Porta, Frank Carl: *See—*
Hamilton, Billy Harold; Kunzinger, Frederick Francis; and La Porta, Frank Carl, 3,906,331.

La Rocque, John W., to American Flange & Manufacturing Co., Inc. Method of processing containers. 3,905,091, Cl. 29-460.000.

Larson, Larry A., to Caterpillar Tractor Company. Swivel mounted lifting eye for engines. 3,905,633, Cl. 294-82.00R.

Larson, Robert M.; and Gabos, Theodore D., to Jos. Schlitz Brewing Company. Apron construction for a pallet loader. 3,905,488, Cl. 214-6.0DK.

Laterra, Salvatore, to Hines, Norman, a part interest. Ski storage rack. 3,905,481, Cl. 211-60.0SK.

Lattin, William Walter, to Motorola, Inc. External data control preset system for inverting cell random access memory. 3,906,464, Cl. 340-173.00R.

Laubie, Michel: *See—*
Vincent, Michel; Remond, Georges; and Laubie, Michel, 3,906,040.

Laudato, Gaetano J., Jr. Railway swimming pool car. 3,905,308, Cl. 105-238.00R.

Lauff, Helmut F.: *See—*
Berndt, Walter; and Lauff, Helmut F., 3,905,489.

Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, to Schering Aktiengesellschaft. Novel pregnanoic acid derivatives. 3,906,095, Cl. 424-243.000.

Lawrence, John E.; and Santoro, Jules C., to Silicon Material, Inc. Method of preparing high yield semiconductor wafer. 3,905,162, Cl. 51-281.0SF.

Lazdowski, John P., to International Paper Company. Disposable douche product. 3,905,370, Cl. 128-232.000.

Le Nickel: *See—*
Bailleux, Michel, 3,905,881.

Lea, James F., Jr.: *See—*
Bradley, William S.; Hardy, William C.; and Lea, James F., Jr., 3,905,553.

Leahy, Dorothy. Method of making a fitted kit. 3,905,087, Cl. 29-428.000.

Leblanc, Leopold, to Beaudoin, Roger. Damper spacer for bundle conductor. 3,906,143, Cl. 174-42.000.

LeBlanc, Oliver H., Jr.: *See—*
Macur, Robert A.; LeBlanc, Oliver H., Jr.; and Grubb, Willard T., 3,905,889.

Lechner, Ernst-Friedrich, to Siemens Aktiengesellschaft. Clamping connector. 3,905,671, Cl. 339-95.00R.

Leczycki, Moshe, to Plasson Maagan Michael Industries Limited. Nut construction screw assembly and valve actuator utilizing same. 3,905,271, Cl. 85-32.00V.

Ledford, James B.: *See—*
Niederer, Edward, Jr.; and Ledford, James B., 3,905,219.

Lee, Bong Kuk; Ryu, Dewey D. Y.; Miraglia, Gennaro John; Basch, Harold I.; and Mukherjee, Barid B., to E. R. Squibb & Sons, Inc. Substituted amino acetamido penicillins. 3,905,955, Cl. 260-239.100.

Lee, Conrad E., to Pako Corporation. Photographic processing machine with oppositely canted transport roller. 3,905,534, Cl. 226-184.000.

Lee, Denis; and Norburn, Leslie, to Imperial Chemical Industries Limited. Operation of mercury-cathode cells. 3,905,880, Cl. 204-99.000.

Lee, Hanju: *See—*
Goytisolo, Jorge Alberto; Chi, Donald Dongsuk; and Lee, Hanju, 3,906,076.

Lee, Henry L., Jr.; and Orlowski, Jan A., to Lee Pharmaceuticals. Composition and method for drying dental surfaces. 3,905,110, Cl. 32-15.000.

Lee Pharmaceuticals: *See—*
Lee, Henry L., Jr.; and Orlowski, Jan A., 3,905,110.

Lefebvre, Jean Henri, to Regie Nationale des Usines Renault. Method of casting parts of high melting point metal in molds. 3,905,415, Cl. 164-72.000.

Legille, Edouard, to S.A. des Anciens Etablissements Paul Wurth. Trailing gauge. 3,905,239, Cl. 73-432.00R.

Le Grady, Carl F. Barbecue grill. 3,905,286, Cl. 99-450.000.

Lehinant, Armand; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the continuous, even dyeing of cotton piece goods containing portions of abnormal fibers. 3,905,762, Cl. 8-30.000.

Lehr, Willi: *See—*
Grommes, Helmut; and Lehr, Willi, 3,905,557.

Lehsten, George S., to Fire Alert Company. Combustion products alarm. 3,906,474, Cl. 340-237.00S.

Leiber, Heinz: *See—*
Muller, Paul; and Leiber, Heinz, 3,905,653.

Leichle, Claude: *See—*
Rivere, Jean-Pierre; Bertuol, Bernard; and Leichle, Claude, 3,906,207.

Leigh Instruments Limited: *See—*
Kelemen, Jozsef W., 3,906,511.

Leisterer, Reinhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for determining the angle between a rotatable body and a fixed coil system, having use in a compass system. 3,906,339, Cl. 324-34.0PS.

Lejonc, Daniel: *See—*
Malavasi, Claude, 3,906,191.

Lenczycki, Joseph J. Endosseous implants. 3,905,107, Cl. 32-10.00A.

Leon Chemical & Plastics Div. of U.S. Industries Inc.: *See—*
Cook, William J.; and Ellens, Gordon A., 3,906,071.

Lepp, Vladimir Romanovich; Vinogradov, Vladimir Alexeevich; Sibgatulin, Kharis Malikovich; and Cherkasov, Jury Nikolaevich. Method of compressing an arc discharge. 3,906,289, Cl. 315-111.000.

Leroux, Jean E., to Societe Anonyme: Poclain. Control means for public works machine. 3,905,501, Cl. 214-762.000.

Lesyk, Leo, to Bird Electronic Corporation. Liquid cooled dummy load for RF transmission line. 3,906,402, Cl. 333-22.00F.

Leu, Charles N. Crayon carrying and storing device. 3,905,529, Cl. 224-48.00R.

Levaillant, Claude; and Bensussan, Andre, to CGR-Mev. Rotary waveguide structure including polarization converters. 3,906,407, Cl. 333-21.00A.

Levin, Donald; and Ward, Walter D., to Esthetic Hair, Inc. Hairpiece with molecularly bonded foundation and method for making same. 3,905,378, Cl. 132-5.000.

Le Vine, Harris D., to Will Ross, Inc. Method and apparatus for operating a gas sensor. 3,906,473, Cl. 340-237.00R.

Lewandowski, Witold; Werkowski, Ryszard; and Gliszewski, Henryk. Precision balance for continuous measurement of small variations of mass. 3,905,434, Cl. 177-208.000.

Lewicki, George W.: *See—*
Maserjian, Joseph; and Lewicki, George W., 3,906,296.

Lewis, Dan, Jr.; Von Alven, Raymond D.; and Prouty, Myron R., to Cutter Laboratories, Inc. Pierceable access port assembly. 3,905,368, Cl. 128-272.000.

Lewis, Gilbert W.: *See—*
United States of America, National Aeronautics and Space Administration; Silver, Robert H.; Lewis, Gilbert W.; Feldstein, Cyril; and Duran, Edward N., 3,905,356.

Libbey-Owens-Ford Company: *See—*
Revells, Robert G.; Rahrig, Donald D.; and Hagedorn, Floyd T., 3,905,794.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Schlangenotto, Heinrich; and Roy, Kurt, 3,906,545.

Lichowsky, Abraham, to Medical Monitors, Inc. Blood pressure apparatus. 3,905,353, Cl. 128-2.05G.

Lichowsky, Abraham, to Medical Monitors, Inc. Blood pressure measuring system. 3,905,354, Cl. 128-2.05M.

Liebich, Rudolf, to Eisenwerke Reintjes GmbH. Hydraulically actuated plate clutch with accumulator. 3,905,459, Cl. 192-109.00F.

Light, Leon Henry, to National Research Development Corporation. Apparatus for integration and averaging. 3,906,190, Cl. 235-61.60A.

Lincoln Brass Works, Inc.: *See—*
Ferlin, William J.; and Mayer, Nelson G., 3,905,756.

Lind, Harold V.; and Frey, Gary D., to Hughes Aircraft Company. Antenna tuning apparatus. 3,906,411, Cl. 333-32.000.

Lindblad, Oskar Lennart. Safety belt for vehicles. 3,905,614, Cl. 280-150.0SB.

Lindemann, Martin K. O., to Gillette Company, The. Aliphatic oxycarbonyl thiosulfates. 3,906,021, Cl. 260-455.00B.

Lindner, Henry; and Kennedy, James D., to Beatrice Foods Company Div. Elgin Molded Plastics. Reflective display device. 3,905,677, Cl. 350-97.000.

Lindo, Neil A.: *See—*
Zinnes, Harold; and Lindo, Neil A., 3,905,997.

Ling, Chester H. K.: *See—*
DuPree, Donald G.; Bailey, Raymond E.; and Ling, Chester H. K., 3,905,400.

Linssen, Henricus Wilhelmus Maria, to U.S. Philips Corporation. Cathode-ray tube for displaying coloured pictures. 3,906,279, Cl. 313-409.000.

Lion Fat & Oil Co., Ltd.: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,906,016.

Liousse, Francois: *See—*
Calvet, Pierre; and Liousse, Francois, 3,905,230.

Lipscomb, George W.: *See—*
Melvin, Waymon A., Jr.; and Lipscomb, George W., 3,906,484.

Lipsky, Stephen E., to General Instrument Corporation. Method and apparatus for determining the direction of arrival of a signal. 3,906,505, Cl. 343-119.000.

Lipson, Stephen G.: *See—*
Feinleib, Julius; and Lipson, Stephen G., 3,906,462.

Lisiecki, Robert E.: *See—*
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Bruan, Eric A.; and Walke, Earl W., Jr., 3,905,280.

Litton Business Systems, Inc.: *See—*
Frechette, Thomas E.; and Rosborg, Daniel J., 3,905,464.
Frechette, Thomas E.; and Rosborg, Daniel J., 3,905,465.
Uhl, Wyman F., 3,906,132.

Liu, Chia-Seng: *See—*
Kim, Charles W.; Liu, Chia-Seng; and Logan, Lawrence J., Jr., 3,906,073.

LKB-Produkter AB: *See—*
Soredal, Gunnar S.; and Sivers, Curt, 3,906,360.

Lo, David S.; and Paul, Maynard C., to Sperry Rand Corporation. Propagation circuit for cross-tie wall memory system. 3,906,466, Cl. 340-174.0TF.

Lobach, James L.: *See—*
Govindarajan, Rangachari; Lobach, James L.; and Nichols, Kenneth E., 3,905,196.

Lockheed Aircraft Corporation: *See—*
Allen, William P., Jr., 3,906,507.

Locking Systems, Inc.: *See—*
Roberts, Marvin E., 3,905,213.

Loeb, Sidney, to Ben-Gurion University of the Negev Research & Development Authority. Method and apparatus for generating power utilizing pressure-retarded-osmosis. 3,906,250, Cl. 290-1.000.

Loesche Hartzerkleinerungs -und Zementmachinen KG: *See—*
Brundiek, Horst, 3,905,559.

Logabax Anoiennement Ateliers Bariquand & Marre: *See—*
David, Michel, 3,905,701.

Logan, Lawrence J., Jr.: *See—*
Kim, Charles W.; Liu, Chia-Seng; and Logan, Lawrence J., Jr., 3,906,073.

Logar, Noel D.: *See—*
Decker, Thomas A.; Kuether, Christian L.; Williams, Robert E.; and Logar, Noel D., 3,905,688.

Logue, George E. Tailgate for dump truck. 3,905,493, Cl. 214-75.00T.

Lombardo, Joseph. Nursing bottle holder. 3,905,571, Cl. 248-102.000.

Long, James B.: *See—*
Berilla, Thomas; Long, James B.; and Martin, Clyde D., 3,905,129.

Long, Kenneth E.; and Taylor, David W., to Nico Magnetics, Inc. Method of making a thin, ferro-magnetic memory layer and article made thereby. 3,905,776, Cl. 29-183.500.

Long, Roger A., to Posta, John J., Jr. Implantable ceramic bone prosthesis. 3,905,047, Cl. 3-1.900.

Loperfido, John C., to Minnesota Mining and Manufacturing Company. Coated seeds. 3,905,152, Cl. 47-57.600.

Lopiccola, Joseph F.: *See—*
Freismuth, Richard J.; and Lopiccola, Joseph F., 3,905,346.

Loughridge, Frederick A.: *See—*
Finch, William A.; Loughridge, Frederick A.; and Marcucci, Rudolf, 3,905,795.

Lourigan, Ronald F., to Webster Electric Company, Inc. Time delayed solenoid valve. 3,906,294, Cl. 317-141.00S.

Louzos, Demetrios V., to Union Carbide Corporation. Zinc fibers and needles and process for preparing the same. 3,905,830, Cl. 136-31.000.

Louzos, Demetrios V., to Union Carbide Corporation. Cyanide and mercury corrosion inhibitors for zinc alkaline galvanic cells. 3,905,833, Cl. 136-107.000.

Lovejoy, Walter R., to Beatrice Foods Co. Molding apparatus. 3,905,740, Cl. 425-438.000.

Lucas Electrical Company, Limited, The: *See—*
Wiley, David, 3,906,144.

Luckenbill, Lawrence F.; and Ellis, Daniel A., to Mueller Co. Driving tool. 3,905,718, Cl. 408-111.000.

Ludloff, Karl. Method of measuring moment of inertia. 3,905,223, Cl. 73-65.000.

Ludwig, Bernard J.: *See—*
Simon, Edward; Reisner, David B.; Ludwig, Bernard J.; Harakal, John J.; and Kletzkin, Milton, 3,905,977.

Luethi, Christian: *See—*
Biland, Hans Rudolf; Duennenberger, Max; and Luethi, Christian, 3,906,033.

Luger, Paul P., to Pioneer Educational Society, The. Transistor network for information storage and retrieval. 3,906,481, Cl. 340-324.00R.

Lukens Steel Company: *See—*
Scott, William W., Jr., 3,905,804.

Lutz, Alfons, to Webasto-Werk W. Baier KG. Level adjusting device for sliding roofs. 3,905,640, Cl. 296-137.00F.

Lutz, Karl-Anton, to Siemens Aktiengesellschaft. TDM exchange with incoming PCM frames delayed with respect to outgoing PCM frames. 3,906,159, Cl. 179-15.0AQ.

Luxa, Gunther: *See—*
Hashoff, Lothar; Luxa, Gunther; Thurk, Joachim; and Diessner, Armin, 3,906,149.

Lynch, James Edward; Parmer, Kenneth Ronald; and Cobaugh, Robert Franklin, to AMP Incorporated. Electrical contact structure and assembly method. 3,905,665, Cl. 339-17.00L.

Lynk, Charles N., Jr.: *See—*
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.

Lyons, Peter F.: *See—*
Frankfort, Hans R. E.; and Lyons, Peter F., 3,905,077.

Lyu, Seung W., to National Can Corporation. Profiled bottom wall for containers. 3,905,507, Cl. 220-66.000.

M & J Valve Company: *See—*
Grove, Marvin H., 3,905,082.

M & T Chemicals Inc.: *See—*
Kushlefsky, Bernard G.; and Whitney, Wendell K., 3,906,103.

Maag Gear-Wheel & Machine Co., Ltd.: *See—*
Sigg, Hans, 3,905,250.

MacDonnell, Robert W.; and Shander, Otto A., to R. W. Mac Company. Resiliently biased pedestal key assembly. 3,905,307, Cl. 105-221.00K.

Mach, Richard L.: *See—*
Haas, Thomas W.; Mach, Richard L.; Studley, Edward; and Hoffman, Robert, 3,906,072.

Macrae, Ralph, to Eaton Corporation. Control cable clip. 3,905,070, Cl. 24-81.0CR.

Macur, Robert A.; LeBlanc, Oliver H., Jr.; and Grubb, Willard T., to General Electric Company. Miniature multifunctional electrochemical sensor for simultaneous carbon dioxide-pH measurements. 3,905,889, Cl. 204-195.00M.

Maddestra, Robert; and Munn, David E., to Damon Corporation. Alcohol burner construction. 3,905,754, Cl. 431-324.000.

Madison Industries, Inc.: *See—*
Bzura, Hyman, 3,905,808.

Madonna, John M., Jr.; and Sargent, Eugene W. Board game apparatus. 3,905,602, Cl. 273-134.0AE.

Maeda, Kazuo; and Tsubokawa, Masakatsu, to Kabushiki Kaisha Kito. Multi-rack stacker system with a conveyor and transverser. 3,905,492, Cl. 214-16.40B.

Maejima, Tsugie, to Takeda Riken Kogyo Kabushikikaisha. Synchronous multi-purpose counter. 3,906,195, Cl. 235-92.0LG.

Magee, Donald L.; Bailey, Walter A.; and Bailey, Roger P. Method and apparatus for filament winding on a corrugated form to produce a cylindrical corrugated glass fiber part. 3,905,856, Cl. 156-425.000.

Maguire, Roy L.; Kupfert, Bernard F.; and Whitehurst, Gerald E., to Caterpillar Tractor Co. Face-type sealing ring with inner seal band. 3,905,607, Cl. 277-92.000.

Mahato, Basanta Kumar: *See—*
Weissman, Eugene Yehuda; and Mahato, Basanta Kumar, 3,905,829.

Mai, Gerhard; and Siepmann, Reiner, to w. C. Heraeus GmbH. Catalyst for purifying exhaust gases. 3,905,918, Cl. 252-462.000.

Maier, Hans-Peter: *See—*
Lehinant, Armand; and Maier, Hans-Peter, 3,905,762.

Maiocco, Hugh V. Two-piece concentric centrifuge sample container. 3,905,528, Cl. 233-26.000.

Majima, Tadashi: *See—*
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.

Makiguchi, Nobuyoshi: *See—*
Kurimura, Yasuo; Furutani, Yoshio; Makiguchi, Nobuyoshi; and Souda, Kenji, 3,905,867.

Malaval, Claude. Rotary thermal engine. 3,905,198, Cl. 60-669.000.

Malavasi, Claude, to Lejonc, Daniel; and Monge, Paul. Electromechanical device for checking the validity of perforated cards. 3,906,191, Cl. 235-61.11C.

Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., to United States Pipe and Foundry Company. Alloy for making ductile iron. 3,905,809, Cl. 75-134.00S.

Mall, Gunther, to Pfaff Industriemaschinen GmbH. Sewing machine with equipment for sewing of parallel seams. 3,905,316, Cl. 112-153.000.

Malpass, Robert C.; Illman, Walter F.; and Conklin, Delano M., to Burlington Industries, Inc. Hot melt size and yarn sized therewith. 3,905,928, Cl. 260-29.20E.

Manabe, Takao; and Kumamoto, Satosi, to Toshiba Kikai Kabushiki Kaisha. Apparatus using solenoid coils for detecting retilinear movement. 3,906,356, Cl. 324-34.00D.

Mancy, Denise: *See—*
Belloc, Andre; Florent, Jean; Mancy, Denise; and Verrier, Jean, 3,906,113.

Mandelbaum, Philip. Storage building structure and a cab for movement therein. 3,905,164, Cl. 52-30.000.

Mann, Michael M., to Northrop Corporation. Combination electron window-sustainer electrode for electron beam discharge devices. 3,906,392, Cl. 331-94.50G.

Manning, Richard A.: *See—*
Lane, Ralph D.; and Manning, Richard A., 3,906,254.

Marchak, Frank J. Paper money identifier. 3,906,449, Cl. 340-149.00R.

Marchetti, Augusto. Device for closing the rear flap of a parallelepiped box. 3,905,175, Cl. 53-76.000.
Marconi Company Limited, The: *See—*
Dobson, William, 3,906,364.
Marcucci, Rudolf: *See—*
Finch, William A.; Loughridge, Frederick A.; and Marcucci, Rudolf, 3,905,795.
Marcus, Israel. Water-soluble tetracyclines. 3,906,043, Cl. 260-559.0AT.
Margrain, Pierre, to Etablissements E. Ragonot. Method of making printed circuits. 3,905,818, Cl. 96-36.200.
Marion Power Shovel Company, Inc.: *See—*
Rogers, James B., 3,905,711.
Markowitz, Isral J., to Stem Development Corporation. Double-acting container safety closure. 3,905,509, Cl. 220-319.000.
Marks, Lawrence M., to Xerox Corporation. Compound screen for object screening. 3,905,822, Cl. 96-116.000.
Marocco, Sergio, to Industrie Pirelli S.p.A. Safety tire having automatic inflating means in the event of tears or punctures. 3,905,412, Cl. 152-340.000.
Marquette Electronics, Inc.: *See—*
Cudahy, Michael J.; and Sherwood, Robert D., 3,905,364.
Marquette Metal Products Company: *See—*
Mehrbrodt, Alphonso W., 3,905,458.
Marsh, William S.: *See—*
Sobin, Ben A.; Routien, John B.; Rao, Koppaka V.; Marsh, William S.; and Garretson, Aline L., 3,906,093.
Martel, Hubert; and Paris, Pierre, to U.S. Philips Corporation. Amplifier for high-frequency signals. 3,906,387, Cl. 330-31.000.
Martel, Jacques; and Heymes, Rene, to Roussel-UCLAF. Process of total synthesis of cephalosporin derivatives and intermediates. 3,905,965, Cl. 260-243.00R.
Martin, Charles R.: *See—*
Harmon, Albert D.; Martin, Charles R.; and Drake, William H., 3,905,186.
Harmon, Albert D.; Martin, Charles R.; and Cleland, Luther A., Jr., 3,905,187.
Martin, Clyde D.: *See—*
Berilla, Thomas; Long, James B.; and Martin, Clyde D., 3,905,129.
Martin, Donald Lyons: *See—*
Somani, Pitambar; and Martin, Donald Lyons, 3,906,107.
Martin, Jerry T.: *See—*
Anderson, Clifford W.; Castrodale, Daniel O.; and Martin, Jerry T., 3,906,141.
Martin, Robert Lanham, to Bell Telephone Laboratories Incorporated. Computer monitoring system. 3,906,454, Cl. 340-172.500.
Martins, Samuel J., to Airheart Products, Inc. Disc brake caliper and torque arm interface assembly and retention. 3,905,455, Cl. 188-73.300.
Maruhachi Kasei Kogyo Kabushiki Kaisha: *See—*
Suzuki, Todao; and Maruyama, Hiroshi, 3,905,749.
Maruyama, Hiroshi: *See—*
Suzuki, Todao; and Maruyama, Hiroshi, 3,905,749.
Marx, Arthur Friedrich; and De Lang, Rudolf. Oestratrienes. 3,905,962, Cl. 260-239.55D.
Maserjian, Joseph; and Lewicki, George W., to United States of America, National Aeronautics and Space Administration. Stored charge transistor. 3,906,296, Cl. 357-7.000.
Masi, James V.: *See—*
Boyce, James J.; Di Giugno, Angelo J.; and Masi, James V., 3,905,463.
Massabo, Vincenzo: *See—*
Gaetani, Ermanno; and Massabo, Vincenzo, 3,905,825.
Massachusetts Institute of Technology: *See—*
Baker, Richard H., 3,906,415.
Mathers, James E., to GTE Sylvania Incorporated. Rare earth activated hafnium phosphate luminescent materials. 3,905,912, Cl. 252-301.40P.
Mathers, James E.: *See—*
Kelsey, Paul V., Jr.; and Mathers, James E., 3,905,911.
Matisoo, Juri; and Zappe, Hans H., to International Business Machines Corporation. Techniques for minimizing resonance amplitudes of Josephson junction. 3,906,538, Cl. 357-5.000.
Matsuda, Yoshio: *See—*
Hasegawa, Akira; Yamaguchi, Yoshiharu; and Matsuda, Yoshio, 3,905,072.
Matsuki, Yoshinori: *See—*
Oyama, Hiroichi; Matsuki, Yoshinori; and Ohkawa, Fujio, 3,905,208.
Matsumoto, Hirofumi: *See—*
Nakada, Masahiko; and Matsumoto, Hirofumi, 3,905,345.
Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Method for adjusting an optical system in an apparatus for recording signal light beams on a photosensitive body. 3,905,703, Cl. 356-106.00R.
Matsumoto, Seiichi; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Difference amplifier with gain controlled by the sum of the inputs. 3,906,389, Cl. 330-59.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Harada, Masahiro; Takeda, Matsuyuki; Ichida, Mamoru; Nozaki, Shohei; and Miyahara, Kenji, 3,905,834.
Minami, Shunji; Takemura, Takehide; and Oka, Shunzo, 3,906,366.
Nakamura, Shoichi; Mori, Eizo; Onaka, Yoshiteru; and Okubo, Tsuneo, 3,906,160.
Nishino, Atsushi; Sonetaka, Kazunori; Kumano, Hiroshi; and Noguchi, Yoshinori, 3,905,917.
Shiraishi, Tadashi; and Yamanaka, Tadashi, 3,905,844.
Yoshino, Kimiaki; Adachi, Kinichi; Shimotsuma, Wataru; Sekine, Yoichi; and Shimizu, Toshio, 3,905,876.
Matsushita Electronics Corporation: *See—*
Hosokoshi, Kakuichiro; and Yoshida, Osamu, 3,906,515.
Matt, Joseph; and Slovinsky, Manuel, to Nalco Chemical Company. Cyanoethyl and haloethyl diamines as bactericides and fungicides. 3,906,105, Cl. 424-304.000.
Mattedi, Bruno A.; and Nemivant, Jitendra G., to Victor Comptometer Corporation. Care memory control circuit. 3,906,453, Cl. 340-172.500.
Mattedi, Bruno A.; and Guagliardo, John J., to Victor Comptometer Corporation. Display system for an electronic business machine. 3,906,457, Cl. 340-172.500.
Matthews, Hugh B.: *See—*
Chen, Evan N.; and Matthews, Hugh B., 3,906,263.
Mattiussi, Andrea; and Modena, Mario, to Montecatini Edison S.p.A. Coating compostions for metal substrates based on ethylenetetrafluoroethylene copolymers. 3,906,060, Cl. 260-897.00C.
Matto, Lawrence R., to Avco Corporation. Gas turbine engine with efficient annular bleed manifold. 3,905,191, Cl. 60-39.070.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Andelfinger, Claus; Dommaschk, Walter; Ott, Werner; Ulrich, Manfred; and Weber, German, 3,906,280.
Ulrich, Reinhard, 3,905,676.
May, Douglas C.: *See—*
Barkey, Kenneth T.; Gandy, Gerald C.; and May, Douglas C., 3,905,938.
Mayer, James E., to D. S. Brown Company, The. Wedge compressor. 3,905,084, Cl. 29-267.000.
Mayer, Nelson G.: *See—*
Ferlin, William J.; and Mayer, Nelson G., 3,905,756.
Maytag Company, The: *See—*
Bergeson, Richard P., 3,905,663.
Mazman, Martin S. Variable resistance exercising device. 3,905,599, Cl. 272-81.000.
McAleer, William J.; Spier, Raymond E.; and Posch, Kenneth L., to Merck & Co., Inc. Cell and vaccine production. 3,905,865, Cl. 195-1.100.
McCartney, Jack D., Jr.: *See—*
Jordan, Glen L., 3,905,421.
McCarty, David W., to Beloit Corporation. Valve for an injection molding machine. 3,905,742, Cl. 425-451.200.
McCloud, Marvin H. Bait holder. 3,905,149, Cl. 43-44.200.
McConnell, Kennedy, to Interlake, Inc. Snap lock for quickly-detachable beam-to-post joint. 3,905,712, Cl. 403-317.000.
McCormick, Larry L., to G & H Technology, Inc. Structural alignment pin and electrical connector assembly. 3,905,669, Cl. 339-65.000.
McCracken, William Lynn, to Honeywell Inc. Optical systems having stop means for preventing passage of boundary wave radiation. 3,905,675, Cl. 350-17.000.
McCrobie, George L.: *See—*
Harper, David C.; McCrobie, George L.; Price, Edgar E.; and Ritter, Joachim A., 3,905,685.
McCullough, Robert W., to Deering Milliken Research Corporation. Slidably mounted yarn support member for a knitting machine. 3,905,210, Cl. 66-125.00R.
McDermott, Richard T.: *See—*
Blasy, Richard M.; and McDermott, Richard T., 3,905,678.
McDonnell Douglas Corporation: *See—*
Amason, Myron P.; and Kung, Joseph T., 3,906,308.
Downing, James W.; Fernandez, Carlos P.; and Sethre, Vernon C., 3,905,241.
McEowen, James Royce, to Bell Telephone Laboratories, Incorporated. Visual status indicator circuit. 3,906,168, Cl. 179-84.00L.
McFarland, Archie Rae, to Beehive Machinery Inc. Process for deboning meat or fish. 3,906,118, Cl. 426-479.000.
McGueyer, James C.: *See—*
Jordan, Glen L., 3,905,421.
McKenney, John D., to Royal Industries, Inc. Tire conditioning apparatus. 3,905,160, Cl. 51-106.00R.
McKenzie, Ian: *See—*
Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., 3,905,407.
McKenzie, Robert L., to United States of America, National Aeronautics and Space Administration. Diatomic infrared gasdynamic laser. 3,906,397, Cl. 331-94.50G.
McManus, James M., to Pfizer Inc. Tricyclicazaindole derivatives. 3,906,000, Cl. 260-326.50B.
McNaughtan, Thomas J.: *See—*
Irwin, Philip G.; McNaughtan, Thomas J.; and Roberts, Joseph G., 3,905,935.
McVey, Charles I.: *See—*
Collins, Byron R.; and McVey, Charles I., 3,906,272.
Mead, Louis W.; and Deutsch, Marshall E., to Thyroid Diagnostics, Inc. Reagent dispenser. 3,905,521, Cl. 222-309.000.
Medical Laboratory Automation, Inc.: *See—*
Hartnett, John J.; Cohen, Jules Barry; and Scordato, Emil A., 3,905,772.
Medical Monitors, Inc.: *See—*
Lichowsky, Abraham, 3,905,353.
Lichowsky, Abraham, 3,905,354.
Megatherm Corporation: *See—*
Stevenson, Robert H., 3,906,242.

Mehrbrodt, Alphonso W., to Marquette Metal Products Company. Electro-magnetically actuated spring clutch. 3,905,458, Cl. 192-26.000.

Meihofer, Edward F., to Butler Automatic, Inc. Web break detector. 3,906,232, Cl. 250-341.000.

Meiji Seika Co., Ltd.: *See—*
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Meister, Erwin, to Von Roll AG. Turntable rail switch for transport systems. 3,905,301, Cl. 104-99.000.

Melissa, Raymond Franklin: *See—*
Barrus, Gordon Brent; Emenaker, Leo Joseph; and Melissa, Raymond Franklin, 3,905,294.

Melnick, Irving: *See—*
Oakes, George W., 3,905,391.

Melton, Paul J.: *See—*
O'Leary, Stephen H.; and Melton, Paul J., 3,905,905.

Meluch, William C.: *See—*
Campbell, Gregory A.; Dearlove, Thomas J.; and Meluch, William C., 3,906,019.

Melvin, Waymon A., Jr.; and Lipscomb, George W., to Westinghouse Electric Corporation. Decoder input circuit for receiving asynchronous data bit streams. 3,906,484, Cl. 340-347.0DD.

Mengel, Klaus: *See—*
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.

Menke, James A.; and Haak, Eugene L., to G. T. Schjeldahl Company. Mooring system arrangement for blimp-shaped tethered balloons. 3,905,567, Cl. 244-115.000.

Mensch, William David, Jr., to Motorola, Inc. MOS current limiting output circuit. 3,906,255, Cl. 307-205.000.

Menz, Dieter, to Preussag Aktiengesellschaft. Process for extracting a manganese concentrate from maritime manganese ore. 3,906,075, Cl. 423-52.000.

Mercier, Gary M. Proof of igniter and flame sensing device and system. 3,906,221, Cl. 250-227.000.

Merck & Co., Inc.: *See—*
Hilleman, Maurice R.; Tytell, Alfred A.; and Woodhour, Allen F., 3,906,092.
McAleer, William J.; Spier, Raymond E.; and Posch, Kenneth L., 3,905,865.

Meriaux, Claude; and Aime, Jacques, to Thomson-CSF. Correlation system for delay measurement. 3,906,213, Cl. 235-181.000.

Mertens & Co. Kommanditgesellschaft: *See—*
Lamkemeyer, Klaus, 3,905,643.

Merz, Dietrich: *See—*
Betz, Hans; Merz, Dietrich; Winter, Heinrich; and Ahlborn, Hans, 3,905,083.

Mesecar, Roderick S.: *See—*
Pearl, Lowell Raymond; and Mesecar, Roderick S., 3,905,706.

Meshbane, Alex; and Vilardi, Frank. Electrophoresis testing apparatus. 3,906,293, Cl. 317-18.00R.

Messner, Carlton E. Lawn maintenance equipment. 3,905,181, Cl. 56-13.100.

Metlesics, Werner; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. 2-[2-(1,3-diazacycloalk-2-enyl]benzophenone derivatives and 1,3-diazacycloalkenyl[2,1-A]isoindole derivatives. 3,905,994, Cl. 260-309.600.

Meussdoerffer, Johann Nikolaus; Niederprum, Hans; and Dahm, Manfred, to Bayer Aktiengesellschaft. N-(perfluoroalkyl-sulphonyl)-carbamic acid esters of polyalkylene oxides. 3,906,027, Cl. 260-468.00E.

Meyding, Lothar, to Ernst Leitz G.m.b.H. Device for testing the contour of an object. 3,905,119, Cl. 33-179.50R.

Meyer, Dean A.: *See—*
Akgulian, Sahag C.; Haffner, Donald G.; and Meyer, Dean A., 3,905,180.

Meyer, Horst: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,905,970.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,905,983.

Meyer, Richard D., to Phillips Petroleum Company. Filament liquid quenching apparatus. 3,905,381, Cl. 134-122.000.

Meyer, Thomas A., to Monarch Marking Systems, Inc. Data retrieval and error detection method and apparatus designed for use in a width-modulated bar-code scanning apparatus. 3,906,202, Cl. 235-61.11E.

Meyerhofer, Dietrich, to RCA Corporation. Liquid crystal devices of improved contrast. 3,905,682, Cl. 350-160.0LC.

Meyerhoff, Robert W., to Union Carbide Corporation. AC Superconducting articles and a method for their manufacture. 3,906,412, Cl. 333-83.00R.

Meyers, Rex T.: *See—*
Prestridge, Floyd L.; Wallace, Harry G.; and Meyers, Rex T., 3,905,891.

Middleton, Robert; Timms, Peter Leslie; and Gibson, Geoffrey Moorhouse, to British Chrome & Chemicals Limited. Preparation of diarene chromium compounds. 3,906,017, Cl. 260-438.50R.

Midland-Ross Corporation: *See—*
Hemsath, Klaus H.; and Vereecke, Frank J., 3,905,751.

Midwest Machine Works, Inc.: *See—*
Smith, Leonard R.; and Kelly, Emmett J., 3,905,155.

Mignot, Lucien E., to Etablissement Public de Diffusion. Device for extracting the square root of a binary number. 3,906,210, Cl. 235-158.000.

Mikulski, Albert J.: *See—*
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.

Mikulski, James J.: *See—*
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.

Miles Laboratories, Inc.: *See—*
Havera, Herbert John, 3,906,100.
Kotick, Michael Paul; Patel, Chimanbhai P.; Colbourn, Joseph L.; and Erickson, Robert J., 3,905,953.
Morris, David Alexander Nathaniel; and Smith, Melvin Dee, 3,905,767.

Miller, Arthur J., to Carrier Corporation. Power expander centrifuge. 3,905,197, Cl. 60-646.000.

Miller, Gladys D.: *See—*
Renk, Richard J.; and Boller, George E., 3,905,659.

Miller, Max W., to Pfizer Inc. 2-Phenyl-as-triazine-3,5(2H,4H)diones. 3,905,971, Cl. 260-247.50C.

Miller, Richard P., to Eli Lilly and Company. Determination of hypertension associated with elevated renin levels. 3,906,085, Cl. 424-9.000.

Miller, William F., to Hy-Way Heat Systems, Inc. Oil burner. 3,905,752, Cl. 431-183.000.

Milligan, Lee J. Universal motor speed control system. 3,906,319, Cl. 318-318.000.

Mina, Kent Vincent: *See—*
Kieburtz, Robert Bruce; and Mina, Kent Vincent, 3,906,199.

Minami, Shunji; Takemura, Takehide; and Oka, Shunzo, to Matsushita Electric Industrial Co., Ltd. Remote control system. 3,906,366, Cl. 325-37.000.

Mindt, Wolfgang; and Fehlmann, Willy, to Hoffmann-La Roche Inc. Electrochemical sensor. 3,905,888, Cl. 204-195.00P.

Minegishi, Toyomasa. Method and apparatus for purifying waste water. 3,905,890, Cl. 204-276.000.

Minnesota Mining and Manufacturing Company: *See—*
Bonham, James A., 3,905,815.
Evensen, Thomas J., 3,906,138.
Farlow, Jan M., 3,906,512.
Klug, James H., 3,905,923.
Loperfido, John C., 3,905,152.
Moore, George G. I.; and Harrington, Joseph Kenneth, 3,906,024.
Patterson, Richard A., 3,905,859.

Minnich, Willy. Propeller. 3,905,719, Cl. 415-126.000.

Mino, Hiroshi; Sasatani, Tadashi; and Kobayashi, Tadaki, to Toyo Kogyo Co., Ltd. Apparatus for producing an annular corrugated spring. 3,905,217, Cl. 72-132.000.

Minolta Camera Kabushiki Kaisha: *See—*
Kobori, Toshio; and Sumita, Toru, 3,906,518.
Kuramoto, Yoshio; Kobori, Toshio; and Ueda, Hiroshi, 3,906,532.
Ueda, Hiroshi; and Yoshizaki, Akira, 3,906,519.
Ueda, Hiroshi, 3,906,521.

Miraglia, Gennaro John: *See—*
Lee, Bong Kuk; Ryu, Dewey D. Y.; Miraglia, Gennaro John; Basch, Harold I.; and Mukherjee, Barid B., 3,905,955.

Miragliotta, Vito. Slide projector and feed arrangement therefor. 3,905,694, Cl. 353-108.000.

Miranda, Andrea. Foldable riding vehicle. 3,905,618, Cl. 280-278.000.

Mita, Kunio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Single lens reflex camera having an interlock arrangement for preventing light measurement errors. 3,906,533, Cl. 354-272.000.

Mita, Yoshinari: *See—*
Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, 3,906,465.

Mitchell, John F.: *See—*
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Hibino, Masahiro; Ito, Toshio; Iwamoto, Masatami; Nomura, Ikuko; and Kishimoto, Fukutaro, 3,906,181.
Kurahashi, Koichiro; and Tottori, Hiroshi, 3,906,290.
Mitsui, Kotaro; Ishizu, Akira; and Susaki, Wataru, 3,905,704.
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.

Mitsubishi Kenki Kabushiki Kaisha: *See—*
Nakamura, Koji; and Nakahishi, Hisao, 3,906,281.

Mitsubishi Kinzou Kogyo Kabushiki Kaisha: *See—*
Saida, Youichi; Ito, Hajime; and Imanaga, Kojiro, 3,905,275.

Mitsubishi Mining & Cement Company, Ltd.: *See—*
Tachibana, Kan-Ichi; Nishioka, Michihiro; and Ono, Mikiya, 3,906,425.

Mitsui, Kotaro; Ishizu, Akira; and Susaki, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Device for determining light directivity of luminescent element. 3,905,704, Cl. 356-152.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Kurimura, Yasuo; Furutani, Yoshio; Makiguchi, Nobuyoshi; and Souda, Kenji, 3,905,867.

Mittelstaedt, Rainer, to Grundig E.M.V. Electro-Mechanische Versuchsanstalt. Apparatus for rapid braking of magnetic tape. 3,906,299, Cl. 318-7.000.

Miura, Kimio, to Honda Giken Kogyo Kabushiki Kaisha. Course correcting device for a vehicle. 3,905,439, Cl. 180-79.20R.

Miura, Yoshiaki: *See*—
Tamaki, Kiheiji; Miura, Yoshiaki; Okamoto, Akira; and Nakamura, Masaaki, 3,906,079.

Miyado, Shinji: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Miyahara, Kenji: *See*—
Harada, Masahiro; Takeda, Matsuyuki; Ichida, Mamoru; Nozaki, Shohei; and Miyahara, Kenji, 3,905,834.

Miyajima, Haruo: *See*—
Torii, Tatsumi; and Miyajima, Haruo, 3,905,456.

Miyamoto, Bunichi; Tanishima, Yasuo; and Shimizu, Takafumi, to Fujitsu Ltd. Frequency discrimination circuit. 3,906,382, Cl. 328-134.000.

Miyamoto, Koichi: *See*—
Komori, Shigehiro; Goshima, Yoshitomo; Katayama, Hajime; and Miyamoto, Koichi, 3,905,697.

Mizuno, Shigeo: *See*—
Takeda, Nobuhiro; Yanagi, Osamu; Mizuno, Shigeo; and Hayashi, Toyoshi, 3,905,121.

Mobil Oil Corporation: *See*—
Florian, John, 3,905,506.
Kaeding, Warren W.; and Butter, Stephen A., 3,906,054.

Mochizuki, Toshio: *See*—
Ishii, Haruo; Urano, Fumio; Kawasaki, Masahiro; and Mochizuki, Toshio, 3,906,531.

Modena, Mario: *See*—
Mattiussi, Andrea; and Modena, Mario, 3,906,060.

Moder, Hans-Ulrich, to Siemens Aktiengesellschaft. Method for connecting and disconnecting system units in a modularly constructed data processing system. 3,906,452, Cl. 340-172.500.

Modern Caster Co., Inc.: *See*—
Hager, Clarence H., 3,905,310.

Moe, Douglas Ashworth, to RCA Corporation. Failure detecting and inhibiting circuit. 3,906,258, Cl. 307-232.000.

Moesch, Rudolf: *See*—
Hofer, Kurt; Moesch, Rudolf; Schilli, Alfred; and Burdet, Evelyne, 3,906,041.

Moller, Bent, to Aktieselskabet Brodrene Hartmann. Sight package for fragile objects. 3,905,542, Cl. 229-29.00M.

Moller, Hans Gunter. Room modules with sanitary devices. 3,905,048, Cl. 4-2.000.

Monarch Marking Systems, Inc.: *See*—
Butulis, Arnis G., 3,906,203.
Meyer, Thomas A., 3,906,202.

Monge, Paul: *See*—
Malavasi, Claude, 3,906,191.

Monrick Holdings Limited: *See*—
Ratowsky, Simon, 3,905,584.

Monroe Auto Equipment Company: *See*—
Greenleaf, Donald B.; and Smith, Dennis J., 3,905,134.

Monsanto Company: *See*—
Dixon, William I., 3,906,062.
Partos, Richard D., 3,906,104.
Phillips, Wendell Gary, 3,906,022.
Roth, Fred S., 3,905,787.

Montecatini Edison S.p.A.: *See*—
Mattiussi, Andrea; and Modena, Mario, 3,906,060.

Montgomery, Michael D. Ventilated ashtray for automobiles. 3,905,639, Cl. 296-37.00R.

Mooradian, Aram: *See*—
Alexander, Ernest John; and Mooradian, Aram, 3,905,998.

Moore, George G. I.; and Harrington, Joseph Kenneth, to Minnesota Mining and Manufacturing Company. Perfluoroalkanesulfonamidoaryl compounds. 3,906,024, Cl. 260-465.00E.

Moore, Paul J.; and Neal, Archie E., to J. E. Love Company. Asparagus harvester receiving bin removal & support means. 3,905,183, Cl. 56-327.00A.

Mori, Eizo: *See*—
Nakamura, Shoichi; Mori, Eizo; Onaka, Yoshiteru; and Okubo, Tsuneo, 3,906,160.

Mori, Kenichi: *See*—
Iijima, Taizo; and Mori, Kenichi, 3,906,446.

Morimoto, Masayoshi: *See*—
Okamoto, Yasushi; and Morimoto, Masayoshi, 3,906,056.

Morino, Kenji: *See*—
Hattori, Shuzo; Eto, Mikio; Morino, Kenji; and Fujita, Tuyoshi, 3,906,510.

Morita, Masaaki: *See*—
Sugiyama, Hiroshi; Oride, Kazuyuki; and Morita, Masaaki, 3,905,652.

Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, to Nippon Electric Company Limited. Hologram graphic data tablet apparatus using a vernier. 3,906,465, Cl. 340-173.0LM.

Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, to Hitachi, Ltd. Line circuit in automatic switching system. 3,906,165, Cl. 179-18.00F.

Moriyama, Inao; Itani, Takashi; and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Projector suitable for film cartridge having self-developing means. 3,905,693, Cl. 352-130.000.

Morris, Charles F. Sheet metal cutter. 3,905,102, Cl. 30-194.000.

Morris, David Alexander Nathaniel; and Smith, Melvin Dee, to Miles Laboratories, Inc. Process for qualitative analysis or quantitation of antigens or antibodies. 3,905,767, Cl. 23-230.00B.

Morris, Richard H.; and Strenglein, Harry F., to Sperry Rand Corporation. Chart adapter for use in recording oscilloscope data. 3,906,362, Cl. 324-113.000.

Morrison, Glenn C.; and Cetenko, Wiaczeslaw A., to Warner-Lambert Company. 1,2,3,4-Tetra hydro-3-aminomethylisoquinolines in the treatment of mental depression. 3,906,099, Cl. 424-258.000.

Morrison, Ralph. Binary-signal display employing a matrix of illuminative elements. 3,906,482, Cl. 340-324.00R.

Mortensen, Harold R., to Bendix Corporation, The. Engine starter gearing. 3,905,245, Cl. 74-7.00C.

Morton Buildings, Inc.: *See*—
Genson, Billie Lee, 3,905,486.
Uphoff, Billie J., 3,905,449.

Morton-Norwich Products, Inc.: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,906,010.
Schwan, Thomas J., 3,905,975.

Moser, Raymond L.: *See*—
Stedman, Robert N.; and Moser, Raymond L., 3,905,497.

Moss, Rachel Tomlinson, executrix: *See*—
Moss, Romeyn K., deceased; and Moss, Rachel Tomlinson, executrix, 3,905,225.

Moss, Romeyn K., deceased; and by Moss, Rachel Tomlinson, executrix. Vehicle testing apparatus and method. 3,905,225, Cl. 73-117.000.

Mossberg, Leif Roger, to Tecator Instrument AB. Apparatus for use in determination of nitrogen by the Kjeldahl method. 3,905,770, Cl. 23-253.00R.

Mosteller, Vern D. Tractor-trailer sensing apparatus for indicating the proximity of the trailer to the tractor. 3,906,442, Cl. 340-61.000.

Motley, David M.; and Cheng, King Y., to Hycom Incorporated. Transversal equalizer for use in double sideband quadrature amplitude modulated system. 3,906,347, Cl. 325-42.000.

Motoren- und Turbinen-Union Munchen GmbH: *See*—
Greune, Christian; and Holzhauer, Hilbert, 3,905,720.

Motorola, Inc.: *See*—
Beckmann, Robert M.; Lamb, James A.; Nieglos, Donald J.; and Reynolds, Gary R., 3,906,445.
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.
Kommrusch, Richard S., 3,906,405.
Lattin, William Walter, 3,906,464.
Mensch, William David, Jr., 3,906,255.
Yu, Robert Tapei, 3,906,463.

Mountain States Telephone & Telegraph Company: *See*—
Jackson, Harry L.; and Boyd, Harry R., 3,905,896.

Moussou, Jean; and Calvet, Robert, to Ceraver. Heat treatment tunnel kiln for products having a circular cross-section. 3,905,758, Cl. 432-128.000.

Mrowca, Joseph J., to Du Pont de Nemours, E. I., and Company. Carboalkoxylation and carboalkoxylation of olefins. 3,906,015, Cl. 260-410.90R.

Mueller Co.: *See*—
Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,905,718.

Mueller, William J., to United States of America, Navy. Low frequency homing system. 3,905,320, Cl. 114-23.000.

Mukai, Kunihiko; and Ikeda, Kikuo, to Nippon Glass Fiber Co., Ltd. Method of producing branched photo-conductive fiber bundles. 3,905,852, Cl. 156-180.000.

Mukherjee, Barid B.: *See*—
Lee, Bong Kuk; Ryu, Dewey D. Y.; Miraglia, Gennaro John; Basch, Harold I.; and Mukherjee, Barid B., 3,905,955.

Muller, Paul; and Leiber, Heinz, to Teldix GmbH. Anti-lock control system with common hydraulic step-by-step valve. 3,905,653, Cl. 303-21.00F.

Mullins, John M., to Hughes Tool Company. Auger with rotatable cutters. 3,905,432, Cl. 175-335.000.

Munn, David E.: *See*—
Maddestra, Robert; and Munn, David E., 3,905,754.

Murdock, Lawrence C., to Westinghouse Electric Corporation. Oscillator circuit for providing a conductivity ratio of sea water. 3,906,353, Cl. 324-30.00R.

Murdock, Lawrence C., to Westinghouse Electric Corporation. Standard conductivity cell for measurement of sea water salinity and temperature. 3,906,354, Cl. 324-30.00B.

Murdock, Lawrence C., to Westinghouse Electric Corporation. Linear period thermistor temperature oscillator. 3,906,391, Cl. 331-66.000.

Murskauskone Oy: *See*—
Hukki, Risto Tapani, 3,905,894.

Murvall, Ake Eugen, to Abu Aktiebolag. Crank handles for fishing reels. 3,905,249, Cl. 74-543.000.

Musiak, Ronald E., to Comark Industries, Incorporated. Nyquist slope filter useful for monitoring video modulation at transmitting station. 3,906,350, Cl. 325-133.000.

Musselman, Don L. Bicycle brake indicating or stop light circuitry with switch contacts mounted on braking element. 3,906,443, Cl. 340-69.000.

Mutafchiev, Stoycho Ivanov: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Myers, Clifford C. Tubeless tire changer. 3,905,413, Cl. 157-1.240.

Myers, Kenneth R., to Caterpillar Tractor Company. Windshield storage latch. 3,905,626, Cl. 292-216.000.
Mylander, Gerald D. Direct operating valve. 3,905,689, Cl. 251-77.000.
N. C. Ashton Limited: *See—*
Ashton, Norman Coupe, 3,905,810.
Nagase, Tsuneyuki; Suzukamo, Gohu; Yoneyshi, Yukio; and Yoshioka, Hirosuke, to Sumitomo Chemical Company, Limited. Process for preparing alkyl trans-chrysanthemate. 3,906,026, Cl. 260-468.00H.
Nagayama, Masuzo: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,906,016.
Nagel, Robert I., to Beatrice Foods Co. 360° Reflex reflector. 3,905,680, Cl. 350-103.000.
Nagel, Robert I., to Beatrice Foods Co. 180° Viewable reflector. 3,905,681, Cl. 350-103.000.
Nagoshi, Saburo, to Fuji Heavy Industries Ltd. System for controlling a missile motion in the homing mode. 3,905,563, Cl. 244-3.150.
Nagy, Istvan; Sulyok, Pal; Vas, Ivan; and Viragh, Istvan, to Novex RT. Method of and apparatus for high speed shearing off of workpieces. 3,905,258, Cl. 83-13.000.
Nakada, Masahiko; and Matsumoto, Hirofumi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Choke assembly for internal combustion engines. 3,905,345, Cl. 123-119.00F.
Nakahishi, Hisao: *See—*
Nakamura, Koji; and Nakahishi, Hisao, 3,906,281.
Nakajima, Yosuke: *See—*
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,905,821.
Nakamura, Giichi. Rotatory shaft fluid bearing. 3,905,658, Cl. 308-36.100.
Nakamura, Koji; and Nakahishi, Hisao, to Mitsubishi Kenki Kabushiki Kaisha. Color cathode ray tube having gas for conduction of heat from shadow mask. 3,906,281, Cl. 313-481.000.
Nakamura, Masaaki: *See—*
Tamaki, Kiheiji; Miura, Yoshiaki; Okamoto, Akira; and Nakamura, Masaaki, 3,906,079.
Nakamura, Shoichi; Mori, Eizo; Onaka, Yoshiteru; and Okubo, Tsuneo, to Matsushita Electric Industrial Co., Ltd. Headphone type FM stereo receiver. 3,906,160, Cl. 179-15.0BT.
Nakanishi, Susumu, to Pfizer Inc. Process for the manufacture of crystalline anhydrous ampicillin. 3,905,959, Cl. 260-239.100.
Nakao, Sadao: *See—*
Hiraoka, Yukio; Nakao, Sadao; and Noda, Yoshinobu, 3,906,139.
Nakazawa, Hideaki; Iikuni, Tetsuo; and Akashi, Mitsumasa, to Toyo Soda Manufacturing Co., Ltd. Process for preparing polychloroprene latex. 3,905,932, Cl. 260-29.70M.
Nakazawa, Shuzi: *See—*
Hareyama, Kyuichi; and Nakazawa, Shuzi, 3,906,430.
Nalco Chemical Company: *See—*
Matt, Joseph; and Slovinsky, Manuel, 3,906,105.
Naone, Phillip L.; and Turner, Raymond R. Outrigger fishing line system with line release. 3,905,148, Cl. 43-43.120.
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, to Thomson-CSF. System for the surveillance of objects moving along a route. 3,906,492, Cl. 343-5.0PD.
Narita, Hiroshi, to Hitachi, Ltd. Control for DC series-wound motor. 3,906,317, Cl. 318-246.000.
National Can Corporation: *See—*
Lyu, Seung W., 3,905,507.
National Mahoobin Kogyo Kabushiki Kaisha: *See—*
Nishioka, Naruo, 3,905,520.
National Meter Parts: *See—*
Campbell, Earle E.; and Fosnaugh, James E., 3,905,231.
National Research Development Corporation: *See—*
Grover, Derrick John, 3,906,197.
Light, Leon Henry, 3,906,190.
Tuke, Michael Anthony, 3,905,105.
National Semiconductor Corporation: *See—*
Hollins, Brian E., 3,906,540.
Neal, Archie E.: *See—*
Moore, Paul J.; and Neal, Archie E., 3,905,183.
Nebeling, Reinhard: *See—*
Schade, Franz; and Nebeling, Reinhard, 3,906,037.
Neeff, Rutger: *See—*
Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 3,906,011.
Nelmark, Jack D.; and Smith, Matthew, to Bucyrus-Erie Company. Mast locking mechanism. 3,905,168, Cl. 52-116.000.
Nelson, Herbert P.: *See—*
Whiting, Harold F.; and Nelson, Herbert P., 3,905,085.
Nelson, Thomas C.: *See—*
Rado, Theodore A.; and Nelson, Thomas C., 3,906,077.
Nemivant, Jitendra G.: *See—*
Mattedi, Bruno A.; and Nemivant, Jitendra G., 3,906,453.
Neophone Equipment: *See—*
Serras-Paulet, Edouard, 3,906,417.
Nerheim, Noble M.: *See—*
United States of America, National Aeronautics and Space Administration; Russell, Gary R.; Nerheim, Noble M.; and Pivirotto, Thomas J., 3,906,398.
Nessler, Norbert; and Fritz, Dieter, to United States of America, Air Force. Digital phase measuring system. 3,906,361, Cl. 324-83.00D.
Neumann, Eckart: *See—*
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, 3,905,946.
Neumann, Kurt, to Wilhelm Leeser GmbH & Co. KG. Plastic web forming apparatus. 3,905,733, Cl. 425-224.000.
Neuworth, Martin B., to Continental Oil Company. Alkylidenedithiobisphenols. 3,906,050, Cl. 260-609.00F.
Newell, Harry Lee, Jr.: *See—*
Boggs, Beryl Aaron; Cooksey, James Judson; Newell, Harry Lee, Jr.; and Showers, John Walter, 3,905,075.
Newlin, Harry O.: *See—*
Hollmann, Walter G.; and Newlin, Harry O., 3,906,127.
NFE International, Ltd.: *See—*
DeMarco, Thomas M., 3,905,621.
NGK Insulators: *See—*
Kobayashi, Kazuo; and Kaneno, Masayuki, 3,905,845.
NGK Insulators Ltd.: *See—*
Igarashi, Hiroshi; Kawaguchi, Toshiyuki; and Sakanishi, Kenji, 3,905,240.
Nicholas, John F.; and Salvagni, Edward A., to United States of America, Army. Pulse amplitude detector. 3,906,259, Cl. 307-235.00R.
Nichols Engineering & Research Corporation: *See—*
von Dreusche, Charles F., Jr., 3,905,757.
Nichols, Howard H. Process and apparatus for incinerating waste materials. 3,905,312, Cl. 110-8.00R.
Nichols, Kenneth E.: *See—*
Govindarajan, Rangachari; Lobach, James L.; and Nichols, Kenneth E., 3,905,196.
Nico Magnetics, Inc.: *See—*
Long, Kenneth E.; and Taylor, David W., 3,905,776.
Nicolas, Yves, to Schlumberger Technology Corporation. Methods for determining velocities and flow rates of fluids flowing in a well bore. 3,905,226, Cl. 73-155.000.
Niederer, Edward, Jr.; and Ledford, James B. Pincer mechanism for pipelines. 3,905,219, Cl. 72-450.000.
Niederprum, Hans: *See—*
Meussdoerffer, Johann Nikolaus; Niederprum, Hans; and Dahm, Manfred, 3,906,027.
Nieglos, Donald J.: *See—*
Beckmann, Robert M.; Lamb, James A.; Nieglos, Donald J.; and Reynolds, Gary R., 3,906,445.
Nielsen, John; and Church, Joseph H. Induced air device for discharging spherical members. 3,905,349, Cl. 124-11.00R.
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Extraction of polyactams. 3,905,946, Cl. 260-78.00L.
Nieuwveld, Aril J. Resilient fastening devices. 3,905,570, Cl. 248-71.000.
Nihon Seikan Kabushiki Kaisha: *See—*
Kawamata, Kiyoshi, 3,905,525.
Nillesen, Antonius Hendrikus Hubertus Jozef, to U.S. Philips Corporation. Circuit arrangement for generating a sawtooth deflection current through a line deflection coil. 3,906,305, Cl. 315-399.000.
Nilsson, Sven Melker, to Ingenjorsfirman Nilcon AB. Method for the manufacture of elongate concrete building blocks. 3,906,069, Cl. 264-70.000.
Nippon Electric Company Limited: *See—*
Akahane, Fumitake; Iwakawa, Tsunekiyo; Imai, Hideyo; Okazaki, Hiroshi; and Wada, Toshio, 3,906,286.
Hareyama, Kyuichi; and Nakazawa, Shuzi, 3,906,430.
Iwakami, Takuya, 3,906,406.
Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, 3,906,465.
Nippon Electric Kagoshima, Ltd.: *See—*
Kobayakawa, Masaki; and Yawata, Kazufumi, 3,906,285.
Nippon Glass Fiber Co., Ltd.: *See—*
Mukai, Kunihiko; and Ikeda, Kikuo, 3,905,852.
Nippon Kayaku Kabushiki Kaisha: *See—*
Yoshikawa, Motohiko; Shimizu, Yoshiaki; Tanaka, Yoshiharu; and Ishii, Kazuo, 3,905,964.
Nippon Kogaku K.K.: *See—*
Tomatsuri, Masakazu, 3,905,526.
Nippon Kokan Kabushiki Kaisha: *See—*
Hikai, Akio; Kobayashi, Yoshiyuki; and Furuta, Kazuyoshi, 3,905,572.
Nippon Paint Co., Ltd.: *See—*
Sakurai, Kiyomi; Fukushima, Yutaka; and Takimoto, Yasuyuki, 3,905,819.
Nippon Soda Company, Limited: *See—*
Enoki, Kichiji; Yao, Toshio; Ishimitsu, Keiichi; Tsukashima, Keiichi; and Ikari, Eiichi, 3,905,995.
Yoshida, Hiroshi; Sasai, Kazuyoshi; and Kubomatsu, Teruo, 3,906,046.
Nippon Steel Corporation: *See—*
Tamaki, Kiheiji; Miura, Yoshiaki; Okamoto, Akira; and Nakamura, Masaaki, 3,906,079.
Nippondenso Co., Ltd.: *See—*
Soda, Kazuya, 3,906,423.
Yonezu, Hisashi, 3,906,476.
Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, 3,906,205.
Nishii, Hideo: *See—*
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.
Nishikubo, Yasuhiko; Ebihara, Heihachiro; Hashimoto, Shingo; and Fukayama, Hiroyuki, to Citizen Watch Co., Ltd. Electronic timepiece. 3,905,188, Cl. 58-23.00R.

Nishimura, Shojiro; and Yonehara, Masanori, to Kobe Steel, Ltd. Fuel stop means for a diesel pile hammer. 3,905,428, Cl. 173-128.000.
Nishino, Atsushi; Sonetaka, Kazunori; Kumano, Hiroshi; and Noguchi, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Catalyst for purifying exhaust gas. 3,905,917, Cl. 252-455.00R.
Nishioka, Michihiro: *See*—
Tachibana, Kan-Ichi; Nishioka, Michihiro; and Ono, Mikiya, 3,906,425.
Nishioka, Naruo, to National Mahoobin Kogyo Kabushiki Kaisha. Vacuum flask provided with a pumping device. 3,905,520, Cl. 222-209.000.
Nissan Motor Co., Ltd.: *See*—
Sugiyama, Hiroshi; Oride, Kazuyuki; and Morita, Masaaki, 3,905,652.
Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
Ohshima, Iwao; Chiba, Seiichi; Shibuya, Yukio; and Ishikawa, Haruhiko, 3,905,122.
Niwa, Tomizo: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.
Noda, Yoshinobu: *See*—
Hiraoka, Yukio; Nakao, Sadao; and Noda, Yoshinobu, 3,906,139.
Noguchi, Yoshinori: *See*—
Nishino, Atsushi; Sonetaka, Kazunori; Kumano, Hiroshi; and Noguchi, Yoshinori, 3,905,917.
Noiles, Douglas G.; and Bryan, Graham W., to United States Surgical Corporation. Multiple spool power pack unit. 3,905,276, Cl. 91-398.000.
Nolan, William J.: *See*—
Krackhardt, Elliott M.; and Nolan, William J., 3,906,282.
Noll, Klaus, to Bayer Aktiengesellschaft. Aqueous dispersions of polyurethane having side chain polyoxyethylene units. 3,905,929, Cl. 260-29.2TN.
Nomura, Ikuko: *See*—
Hibino, Masahiro; Ito, Toshio; Iwamoto, Masatami; Nomura, Ikuko; and Kishimoto, Fukutaro, 3,906,181.
Nomura, Katsuhiko; Urano, Fumio; and Kurei, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Manual stop-down device for cameras having automatic exposure controls. 3,906,517, Cl. 354-51.000.
Norburn, Leslie: *See*—
Lee, Denis; and Norburn, Leslie, 3,905,880.
Norfin, Inc.: *See*—
Davis, Ernest D., 3,905,594.
Northrop Corporation: *See*—
Mann, Michael M., 3,906,392.
Norton Company: *See*—
Torti, Maurice L., Jr., 3,905,723.
Novak, Raymond F.; Ramspeck, Howard B.; Geist, Bernard W.; and Potucek, Frank R., to Duo-Fast Corporation. Fastener driving tool. 3,905,535, Cl. 227-120.000.
November, Milton H., to International Telephone and Telegraph Corporation. Net weight oil computer or the like. 3,906,198, Cl. 235-151.350.
Novex RT.: *See*—
Nagy, Istvan; Sulyok, Pal; Vas, Ivan; and Viragh, Istvan, 3,905,258.
Nowak, Gerald, to Olympia Werke AG. Multielectrode electrographic printing device. 3,905,462, Cl. 197-1.00R.
Nozaki, Shohei: *See*—
Harada, Masahiro; Takeda, Matsuyuki; Ichida, Mamoru; Nozaki, Shohei; and Miyahara, Kenji, 3,905,834.
Numazu, Ichiro; Okutsu, Yasuhiro; and Aoki, Matsutarou, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Sheet filing device. 3,905,068, Cl. 24-67.500.
Nussbaumer, Henri J., to International Business Machines Corporation. Digital filters. 3,906,218, Cl. 235-156.000.
Nystrand, Ernst D., to Paper Converting Machine Company. Log sawing system. 3,905,260, Cl. 83-155.000.
O. Hommel Company, The: *See*—
Carini, George Francis; Hommel, Ernest Mayer; and Twigger, James Raymond, 3,906,124.
Oakes, George W., to Melnick, Irving. Magnetic flap valve. 3,905,391, Cl. 137-525.300.
Oba, Seiichiro; Tabuse, Akira; and Yasumoto, Koji, to Tokuyama Soda Kabushiki Kaisha. Process for preparing vinyl chloride polymer composition having improved impact strength and processability. 3,906,059, Cl. 260-878.00R.
Obayashi, Koji: *See*—
Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, 3,905,866.
O'Brien & Brauer Construction, Inc.: *See*—
Brauer, Robert C., 3,905,574.
O'Callaghan, Gerald F.; and Woelz, Donald D., to Eaton Corporation. Controlled velocity drive. 3,906,327, Cl. 318-603.000.
Oce-van der Grinten N.V.: *See*—
Crommentuyn, Gerardus J.; Hagendoorn, Joannes A.; and Knibbe, Hendrik, 3,905,814.
Odaka, Fumio: *See*—
Iseda, Yutaka; Kitayama, Motozumi; Odaka, Fumio; and Anzai, Shiro, 3,905,945.
Oehler, Harry G.: *See*—
Blaha, Franklyn C.; and Oehler, Harry G., 3,906,359.
Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See*—
Calvet, Pierre; and Liousse, Francois, 3,905,230.
Officine Savio S.p.A.: *See*—
Buddecke, Heinrich, 3,905,074.
Ogawa, Hisaharu: *See*—
Suzuki, Yasoji; and Ogawa, Hisaharu, 3,906,256.
Ogiso, Mitsutoshi; and Ohtaki, Shohei, to Canon Kabushiki Kaisha. Device for photographing recording data onto the film in a photographic camera. 3,906,523, Cl. 354-109.000.
Oguchi, Kikuo, to Kabushiki Kaisha Suwa Seikosha. Crystal vibrator. 3,906,260, Cl. 310-9.600.
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Linear acceleration apparatus with cooling system. 3,906,261, Cl. 310-12.000.
Ohhashi, Masanori: *See*—
Tawara, Junro; and Ohhashi, Masanori, 3,905,096.
Ohi, Reiichi: *See*—
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; and Kondo, Tokiharu, deceased, 3,905,821.
Ohkawa, Fujio: *See*—
Oyama, Hiroichi; Matsuki, Yoshinori; and Ohkawa, Fujio, 3,905,208.
Ohlson, Kurt Lennart. Folder. 3,905,538, Cl. 229-1.50R.
Ohms, Klaus-Peter: *See*—
Himmler, Gunther; and Ohms, Klaus-Peter, 3,905,224.
Ohnaka, Makoto, to Shiroyama Kogyo Kabushiki Kaisha. Apparatus for changing the position of a manipulator arm. 3,905,569, Cl. 248-16.000.
Ohshima, Iwao; Chiba, Seiichi; Shibuya, Yukio; and Ishikawa, Haruhiko, to Nitto Kagaku Kogyo Kabushiki Kaisha. Method for drying polymer hydrogel. 3,905,122, Cl. 34-17.000.
Ohtaki, Shohei: *See*—
Ogiso, Mitsutoshi; and Ohtaki, Shohei, 3,906,523.
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; and Kondo, Tokiharu, deceased (by Kondo, Yoshiharu, legal representative), to Fuji Photo Film Co., Ltd. Sensitized silver halide emulsion containing a halogenated triazine as sensitizer and a halogenated compound hardening agent. 3,905,821, Cl. 96-107.000.
Oishi, Kazuo: *See*—
Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, 3,906,205.
Oka, Shunzo: *See*—
Minami, Shunji; Takemura, Takehide; and Oka, Shunzo, 3,906,366.
Okabe, Hideo; and Schwarz, Frederick P., to United States of America, Commerce. Nitric oxide pollution monitor. 3,906,226, Cl. 250-304.000.
Okada, Motohiro; and Omori, Taiji, to Honda Giken Kogyo Kabushiki Kaisha. Control device for emergency lock type vehicle safety belt. 3,905,440, Cl. 180-82.00C.
Okada, Takashi, to Sony Corporation. Transistor control circuit. 3,906,246, Cl. 307-229.000.
Okamoto, Akira: *See*—
Tamaki, Kiheiji; Miura, Yoshiaki; Okamoto, Akira; and Nakamura, Masaaki, 3,906,079.
Okamoto, Yasushi; and Morimoto, Masayoshi, to Sumitomo Chemical Company, Limited. Composition comprising an ethylene-propylene rubber and an amorphores ethylene-propylene block copolymer. 3,906,056, Cl. 260-876.00B.
Okazaki, Hiroshi: *See*—
Akahane, Fumitake; Iwakawa, Tsunekiyo; Imai, Hideyo; Okazaki, Hiroshi; and Wada, Toshio, 3,906,286.
Oki Electric Industry Co., Ltd.: *See*—
Watanabe, Akinori; and Tanoshima, Katsuhide, 3,906,355.
Okubo, Tsuneo: *See*—
Nakamura, Shoichi; Mori, Eizo; Onaka, Yoshiteru; and Okubo, Tsuneo, 3,906,160.
Okuno, Yoshitoshi; Toyoura, Akira; and Higo, Akio, to Sumitomo Chemical Company, Limited. Synergistic chrysanthemate insecticides. 3,906,089, Cl. 424-45.000.
Okutsu, Yasuhiro: *See*—
Numazu, Ichiro; Okutsu, Yasuhiro; and Aoki, Matsutarou, 3,905,068.
Okuyama, Teruo, to Central Glass Co., Ltd. Apparatus for scoring a strip of glass sheet. 3,905,261, Cl. 83-11.000.
O'Leary, Stephen H.; and Melton, Paul J., to IVAC Corporation. Filter unit. 3,905,905, Cl. 210-436.000.
O'Leary, Timothy J.: *See*—
Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., 3,905,784.
Olofson, Roy A.; Schnur, Rodney C.; and Bunes, Leonard A., to Research Corporation. N-dealkylation of tertiary amines. 3,905,981, Cl. 260-285.000.
Olsen, John H.; and Thomas, Benjamin A., to Flow Research, Inc. High pressure seal. 3,905,608, Cl. 277-188.000.
Olympia Werke AG: *See*—
Nowak, Gerald, 3,905,462.
Omark Industries, Inc.: *See*—
Ballew, James S., 3,905,118.
Omori, Taiji: *See*—
Okada, Motohiro; and Omori, Taiji, 3,905,440.
Onaka, Yoshiteru: *See*—
Nakamura, Shoichi; Mori, Eizo; Onaka, Yoshiteru; and Okubo, Tsuneo, 3,906,160.
O'Neill, Gerald J.: *See*—
Holdsworth, Robert S.; Billings, Charles A.; and O'Neill, Gerald J., 3,906,052.

O'Neill, Gerald Joseph: *See—*
Billings, Charles Alden; O'Neill, Gerald Joseph; and Simons, Charles William, 3,906,111.

O'Neill, Joseph P., Jr., to General Engines Co., Inc. Electrically driven assist unit for rider propelled vehicles. 3,905,442, Cl. 180-33.00D.

Ono, Mikiya: *See—*
Tachibana, Kan-Ichi; Nishioka, Michihiro; and Ono, Mikiya, 3,906,425.

Ono, Takehiko; and Taguchi, Nobuo, to Tokyo Shibaura Electric Co., Ltd. Industrial robot. 3,906,323, Cl. 318-563.000.

Ooba, Shigehiro: *See—*
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.

OPI-Textile: *See—*
Daniel, Rene A., 3,905,327.

Optics Technology, Inc.: *See—*
Phillips, Brian G., 3,906,520.

Oratronics, Inc.: *See—*
Weiss, Charles M.; and Judy, Kenneth, 3,905,108.

Ord, Walter Desmond, to Redman Fisher Engineering Limited. Chain for conveyor system. 3,905,304, Cl. 104-172.00C.

Ordonez, Raul Poblano; Rosado, Antonio Acuna; Petrirena, Francisco Garaicochea; and Rivera de Campos, Edith, to Instituto Mexicano del Petroleo. Setting retarder composition for use in cementation and recementation of cased oil wells. 3,905,826, Cl. 106-315.000.

Organ, Glenn E.: *See—*
Dirks, Jerald E.; and Organ, Glenn E., 3,906,036.

Oride, Kazuyuki: *See—*
Sugiyama, Hiroshi; Oride, Kazuyuki; and Morita, Masaaki, 3,905,652.

Oriental Photo Industrial Co., Ltd.: *See—*
Hattori, Shuzo; Eto, Mikio; Morino, Kenji; and Fujita, Tuyoshi, 3,906,510.

Orlowski, Jan A.: *See—*
Lee, Henry L., Jr.; and Orlowski, Jan A., 3,905,110.

Orr, Robert S., to Caterpillar Tractor Co. Spring loaded bearing arrangement. 3,905,661, Cl. 308-207.00A.

Osenbaugh, Carl D.; and Bollet, Ronald E., to Dana Corporation. Method of constructing a one-piece aluminum differential housing. 3,905,089, Cl. 29-434.000.

Oshima, Shigeru, to Fuji Photo Film Co., Ltd. Flashcube mount. 3,906,524, Cl. 354-142.000.

Oshima, Shigeru, to Fuji Photo Film Co., Ltd. Simplified camera. 3,906,530, Cl. 354-206.000.

Oshio, Kazuharu: *See—*
Ogura, Shinzou; Iwamoto, Masatami; Fukushima, Mitsuru; Oshio, Kazuharu; Majima, Tadashi; Kaneda, Toshiyuki; and Nishii, Hideo, 3,906,261.

Ostapko, Daniel L.: *See—*
Hong, Se J.; and Ostapko, Daniel L., 3,906,485.

Ostrozynski, Robert Leopold, to Union Carbide Corporation. Polysiloxane carbamate compounds. 3,906,018, Cl. 260-448.20N.

Ott, Werner: *See—*
Andelfinger, Claus; Dommaschk, Walter; Ott, Werner; Ulrich, Manfred; and Weber, German, 3,906,280.

Ourdouillie, Andre P., to Poclain. Manufacturers of jacks operated by high pressure fluid. 3,905,278, Cl. 92-10.000.

Owens-Corning Fiberglas Corporation: *See—*
Blewett, Donald A.; and Adams, Richard G., 3,905,855.

Owens-Illinois, Inc.: *See—*
Cooley, Richard F., 3,906,396.
Pirooz, Perry P., 3,906,147.

Oyama, Hiroichi; Matsuki, Yoshinori; and Ohkawa, Fujio, to Bridgestone Tire Company Limited. Flexible shaft coupling. 3,905,208, Cl. 64-11.00R.

Ozaki, Toshiaki: *See—*
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.

P. R. Mallory & Co. Inc.: *See—*
Shoot, Lyle E.; and Lambermont, John, 3,906,311.

Pacific Adhesives Company, Inc.: *See—*
Cone, Charles N.; and Steinberg, Julius M., 3,905,329.
Cone, Charles N.; and Steinberg, Julius M., 3,905,921.

Pacific Technica Corporation: *See—*
Feldmann, Fritz K., 3,905,299.

Pacilio, Joseph C., to Continental Can Company, Inc. Control circuit for controlling the feed of a cap sterilizer feed system. 3,905,317, Cl. 113-114.00R.

Packaging Coordinators Inc.: *See—*
Gerner, Daniel F.; and Sauter, Richard S., 3,905,479.

Packard Instrument Company, Inc.: *See—*
Frank, Edmund, 3,905,453.

Packard, Thomas G. Mathematical calculating. 3,906,193, Cl. 235-89.00R.

Paddock, Gordon R.: *See—*
Heilman, Gerald D.; and Paddock, Gordon R., 3,905,193.

Painter, John B., to Johns-Manville Corporation. Method of making spiral wound gaskets. 3,905,090, Cl. 29-455.000.

Pako Corporation: *See—*
Lee, Conrad E., 3,905,534.

Paladian, Barbu Eugeniu, to Societe d'Etudes de Constructions et Travaux (SECTRA), a part interest. Elevating equipment for loads such as prefabricated floor sections. 3,905,579, Cl. 254-105.000.

Palatnick, Leonard; and Shiner, Robert L., to Palatnick, Leonard. Lug nut remover. 3,905,254, Cl. 81-57.300.

Panis, Constantius Johannes Waltherus: *See—*
Duistermaat, Jan Hendrik; and Panis, Constantius Johannes Waltherus, 3,906,288.

Paparatto, Pietro: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; Passalenti, Beppino; and Paparatto, Pietro, 3,905,948.

Paper Converting Machine Company: *See—*
Nystrand, Ernst D., 3,905,260.

Papst-Motoren KG: *See—*
Doemen, Benno, 3,906,320.

Paraskos, John A.: *See—*
Christman, Robert D.; Henke, Alfred M.; Paraskos, John A.; Wilson, Geoffrey R.; and Yanik, Stephen J., 3,905,893.

Parenti, Edmund K., Jr.; Bloomfield, David P.; Grevstad, Paul E.; and Beal, Daniel W., to United Technologies Corporation. Electrolysis cell system including recirculating product gas stream for cooling the cell. 3,905,884, Cl. 204-129.000.

Paris, Pierre: *See—*
Martel, Hubert; and Paris, Pierre, 3,906,387.

Parker, Delmer G.: *See—*
Fraser, Lawrence J.; and Parker, Delmer G., 3,906,121.

Parker, William H., to Del Norte Technology, Inc. Method of making a three-dimensional seismic profile of ocean floor. 3,906,352, Cl. 340-7.00R.

Parkinson, Dean B.: *See—*
Fishman, Norman; and Parkinson, Dean B., 3,906,055.

Parmer, Kenneth Ronald: *See—*
Lynch, James Edward; Parmer, Kenneth Ronald; and Cobaugh, Robert Franklin, 3,905,665.

Pars, Harry George: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Terris, Barbara Zitko, 3,905,969.

Partos, Richard D., to Monsanto Company. Insecticidal sulfonates. 3,906,104, Cl. 424-303.000.

Pascale, John V.: *See—*
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., 3,906,119.

Passalenti, Beppino: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; Passalenti, Beppino; and Paparatto, Pietro, 3,905,948.

Patel, Arvind C., to Ashland Oil, Inc. Radiochemical method for determining treadwear. 3,905,221, Cl. 73-8.000.

Patel, Chimanbhai P.: *See—*
Kotick, Michael Paul; Patel, Chimanbhai P.; Colbourn, Joseph L.; and Erickson, Robert J., 3,905,953.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Franck, Gunter; and Busch, Lothar, 3,906,284.

Patrick, Ian M., to Honeywell Inc. Instrument mounting rack. 3,905,483, Cl. 211-177.000.

Patrikios, Michael J. Automatic extinguisher for candles and the like. 3,905,746, Cl. 431-35.000.

Patterson, Darrell G.: *See—*
Gordon, Michael S.; Colenbrander, August; and Patterson, Darrell G., 3,905,130.

Patterson, James: *See—*
Elwood, Albert A.; and Patterson, James, 3,905,424.

Patterson, Jeffrey E.: *See—*
Guster, Allan; and Patterson, Jeffrey E., 3,906,504.

Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Vacuum wheel apparatus for applying tabbed strips of adhesive. 3,905,859, Cl. 156-443.000.

Paul, Maynard C.: *See—*
Lo, David S.; and Paul, Maynard C., 3,906,466.

Pav-Saver Corporation: *See—*
Dale, Charles Harry, 3,905,715.

Pawlak, Raymond M.: *See—*
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., 3,906,513.

Paxton, Gerald C., to SWF Machinery, Inc. Container. 3,905,541, Cl. 229-23.00R.

Pearce, Jai K.: *See—*
Schempp, Eberhard G.; Pearce, Jai K.; and Schroeder, David L., 3,905,589.

Pearl, Lowell Raymond; and Mesecar, Roderick S., to United States of America, Navy. Light responsive bathyirradiometer. 3,905,706, Cl. 356-224.000.

Pearlman, Michael D. Release mechanism for large chain. 3,905,190, Cl. 59-93.000.

Pearsall, Duane D.: *See—*
Coulter, Gordon L.; and Pearsall, Duane D., 3,905,063.

Pearson, Robert C., to Westinghouse Electric Corporation. Mirror with optically polished surface. 3,905,778, Cl. 29-191.000.

Pecherer, Benjamin: *See—*
Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, 3,906,006.

Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, to Morton-Norwich Products, Inc. Series of 5-aryl-2-furamidines. 3,906,010, Cl. 260-347.500.

Peltola, Ronald Wayne: *See—*
Addis, John Lindsey; and Peltola, Ronald Wayne, 3,906,344.

Pennsylvania Engineering Corporation: *See—*
Schempp, Eberhard G.; Pearce, Jai K.; and Schroeder, David L., 3,905,589.

Pennwalt Corporation: *See—*
Hager, Robert Bonner; and Toukan, Sameeh Said, 3,906,049.

Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 3,905,340.
Boyesen, Eyvind, 3,905,341.
Boyesen, Eyvind, 3,905,342.
Perkins, Glen E. Method for restoring concrete road surfaces. 3,905,714, Cl. 404-72.000.
Perkins, Melvin A.; and Urion, Howard K., to Du Pont de Nemours, E. I., and Company. Stilbene azo lithium salt dyes. 3,905,949, Cl. 260-143.000.
Perronnet, Jacques; and Teche, Andre, to Roussel-UCLAF. Imidazolidones. 3,905,996, Cl. 260-309.700.
Perry, Clark William, to Hoffmann-La Roche Inc. Stereoselective synthesis of intermediate for preparation of meso-nordihydroguaiaretic acid. 3,906,004, Cl. 260-340.300.
Pers, Nils G.: *See—*
Johansson, Leif A. T.; and Pers, Nils G., 3,905,760.
Persico, George J., to Recreational Industries Inc. Top and side door van conversion assembly. 3,905,638, Cl. 296-26.000.
Persson, Bror Arthur, to Ingvar Valentin Falk. Method and apparatus of lubricating sealing rings disposed axially between two machine elements. 3,905,450, Cl. 184-6.140.
Pertec Corporation: *See—*
Barrus, Gordon Brent; Emenaker, Leo Joseph; and Melissa, Raymond Franklin, 3,905,294.
Peterman, Donald J.; and Figueroa, Ramon. Boat mooring cleat. 3,905,322, Cl. 114-218.000.
Peterson, Dale S.; Vartikian, Onick M.; and Fieri, Anthony J., to American Forest Products Corporation. Container construction and end panel therefor. 3,905,478, Cl. 206-523.000.
Peterson, Ralph L. Apparatus for moving a plug fitting. 3,905,396, Cl. 138-97.000.
Peterson, Raymond L.; and Garritt, Robert H., Jr., to American Shoe Machinery Corporation. Die cutting machine. 3,905,265, Cl. 83-537.000.
Petrirena, Francisco Garaicochea: *See—*
Ordonez, Raul Poblano; Rosado, Antonio Acuna; Petrirena, Francisco Garaicochea; and Rivera de Campos, Edith, 3,905,826.
Petrohilos, Harry G., to Techmet Company. Optical measuring apparatus. 3,905,705, Cl. 356-160.000.
Petschauer, Richard J., to Sperry Rand Corporation. Error logging in semiconductor storage units. 3,906,200, Cl. 235-153.0AK.
Petterson, Bengt Edvard, to Sunds Aktiebolag. Method for the liquid treatment of, primarily, cellulosic pulp. 3,905,766, Cl. 8-156.000.
Peyrard, Marcel. Front chain-wheel arrangement for bicycles. 3,905,248, Cl. 74-243.00R.
Pfaff Industriemaschinen GmbH: *See—*
Bolldorf, Kurt; and Busch, Edgar, 3,905,314.
Mall, Gunther, 3,905,316.
Pfizer Inc.: *See—*
Dominy, Beryl William; Hess, Hans-Jurgen Ernst; and Koch, Richard Carl, 3,905,800.
Hamsher, James J., 3,905,868.
McManus, James M., 3,906,000.
Miller, Max W., 3,905,971.
Nakanishi, Susumu, 3,905,959.
Sobin, Ben A.; Routien, John B.; Rao, Koppaka V.; Marsh, William S.; and Garretson, Aline L., 3,906,093.
Pfouts, John Richard, to Whirlpool Corporation. Fault detector for igniter testing using high frequency noise. 3,906,342, Cl. 324-62.000.
Phelan, Harry Richard, to Harris-Intertype Corporation. Dual polarization spiral antenna. 3,906,514, Cl. 343-895.000.
Phenix, Charles E.: *See—*
Runyon, F. Sheldon; Strantz, Lawrence D.; Webb, Darryl S.; and Phenix, Charles E., 3,905,438.
Philip, Alexander Schroder; and Arnold, John Spencer, to Plessey Handel und Investments A.G. Digital switching networks with feed-back link for alternate routing. 3,906,164, Cl. 179-18.0EA.
Phillippi, Larry R.: *See—*
Johansen, Hans A.; Phillippi, Larry R.; and Green, Edward A., 3,905,398.
Phillips, Berry W., to Analog Devices, Incorporated. Bipolar dual-ramp analog-to-digital converter. 3,906,486, Cl. 340-347.0NT.
Phillips, Brian G., to Optics Technology, Inc. Apparatus for producing a high contrast visible image from an object. 3,906,520, Cl. 354-62.000.
Phillips Petroleum Company: *See—*
Bresson, Clarence R.; and Cobb, Raymond L., 3,906,042.
Carter, Cecil O., 3,906,051.
Farha, Floyd E., Jr., 3,906,009.
Griffin, Donald E.; Brown, Byron T.; and Williams, William H., 3,905,874.
Johnson, Lewis T., 3,905,510.
Meyer, Richard D., 3,905,381.
Reusser, Robert E., 3,905,782.
Phillips, Wendell Gary, to Monsanto Company. Substituted dichloromethane sulfenyl esters and their manufacture. 3,906,022, Cl. 260-456.00A.
Photocircuits Division of Kollmorgen Corporation: *See—*
de Graffenried, Albert L., 3,906,268.
Pierce, Martha Murphy, executrix: *See—*
Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased, 3,905,854.
Pierce, Robert M.; Smith, Philip W.; and Kaminski, Walter R., to United Aircraft Corporation. Combustor having staged premixing tubes. 3,905,192, Cl. 60-39.710.
Pierce, Stanley Wiswell, deceased: *See—*
Kaercher, Ralph William; and Pierce, Stanley Wiswell, deceased, 3,905,854.
Pierdet, Andre: *See—*
Bucourt, Robert; Pierdet, Andre; and Salmon, Jean, 3,906,096.
Pierson, Marvin B.: *See—*
Jasper, Joseph C.; and Pierson, Marvin B., 3,905,780.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Numazu, Ichiro; Okutsu, Yasuhiro; and Aoki, Matsutarou, 3,905,068.
Pioneer Educational Society, The: *See—*
Luger, Paul P., 3,906,481.
Pirooz, Perry P., to Owens-Illinois, Inc. Vitreous seals for glass electrical conduits. 3,906,147, Cl. 174-84.00R.
Piskoti, Charles, to SWS Silicones Corporation. Mold release composition. 3,905,823, Cl. 106-38.220.
Pitman, Raymond F.; and Dale, William T., to R O Products, Inc. Function switch arrangement for hand-held remote control unit. 3,906,369, Cl. 325-111.000.
Pitney-Bowes, Inc.: *See—*
Labore, Walter T.; and Hallenbeck, Richard A., 3,905,325.
Pittaway, Lawrence Graham, to U.S. Philips Corporation. Ion gauges. 3,906,237, Cl. 250-489.000.
Pittet, Alan O.; Pascale, John V.; and Hruza, Denis E., to International Flavors & Fragrances Inc. Flavoring methods and compositions. 3,906,119, Cl. 426-535.000.
Pivirotto, Thomas J.: *See—*
United States of America, National Aeronautics and Space Administration; Russell, Gary R.; Nerheim, Noble M.; and Pivirotto, Thomas J., 3,906,398.
Planet Corporation: *See—*
Wayne, Mark, 3,905,495.
Plasson Maagan Michael Industries Limited: *See—*
Leczycki, Moshe, 3,905,271.
Plessey Handel und Investments A.G.: *See—*
Philip, Alexander Schroder; and Arnold, John Spencer, 3,906,164.
Plessey Incorporated: *See—*
Frazee, Lawrence E.; and Fraioli, Anthony V., 3,906,426.
Plouffe, Leo A.: *See—*
Vieira, Joseph G.; and Plouffe, Leo A., 3,906,248.
Plumat, Emile; Schottey, Jean; and Toussaint, Francois, to Glaverble-Mecaniver. Method for making colored transparent articles. 3,905,791, Cl. 65-30.000.
Poclain: *See—*
Ourdouillie, Andre P., 3,905,278.
Poguntke, Dieter, to Siemens Aktiengesellschaft. Series-coupled emitter coupled logic (ECL) circuit having a plurality of independently controllable current paths in a lower plane. 3,906,212, Cl. 235-176.000.
Pohl, Gerhard. Weldability of articles made from plastic foams. 3,906,134, Cl. 428-206.000.
Poirot, Eugene M. Fishing net. 3,905,143, Cl. 43-7.000.
Polaroid Corporation: *See—*
Brandt, Edison R., 3,906,244.
Erlichman, Irving, 3,906,527.
Johnson, Bruce K., 3,906,528.
Scholz, Donald T., 3,905,690.
Policlinica de Stomatologie Protetica a Muncipiului Bucuresti: *See—*
Costa, Eugen; Ene, Lucian; Dumitrescu, Stelica; and Covaci, Ion, 3,905,106.
Polischuk-Sawtschenko, Alexander, to International Business Machines Corporation. Remote synchronous loop operation over half-duplex communications link. 3,906,153, Cl. 178-58.00A.
Poncet, Pierre. Hydraulic press for molding plastic materials. 3,905,741, Cl. 425-450.100.
Porta-Tool, Incorporated: *See—*
Brooks, Daryl G., 3,905,717.
Porter, James H.: *See—*
Weavell, Jack; and Porter, James H., 3,905,266.
Posch, Kenneth L.: *See—*
McAleer, William J.; Spier, Raymond E.; and Posch, Kenneth L., 3,905,865.
Post Office, The: *See—*
Rollett, John Mortimer, 3,906,390.
Posta, John J., Jr.: *See—*
Long, Roger A., 3,905,047.
Potucek, Frank R.: *See—*
Novak, Raymond F.; Ramspeck, Howard B.; Geist, Bernard W.; and Potucek, Frank R., 3,905,535.
Poundstone, William N., to Consolidation Coal Company. Apparatus for raise drilling. 3,905,430, Cl. 175-53.000.
Powers, Richard G.: *See—*
Guy, Michael G.; and Powers, Richard G., 3,906,086.
PPG Industries, Inc.: *See—*
Du Bois, Donald W., 3,905,837.
Lackore, James Kneeland, 3,906,217.
Prado, Eduardo da Silva, Jr. Electronic system for the recording of periodically sampled variables. 3,906,450, Cl. 340-150.000.
Preeman, Marvin B., to Stansteel Corporation. Mobile asphalt plant. 3,905,587, Cl. 259-158.000.
Preslar, Mack J.: *See—*
Feezor, Michael D.; and Preslar, Mack J., 3,905,131.
Prestridge, Floyd L.; Wallace, Harry G.; and Meyers, Rex T., to Combustion Engineering, Inc. Electric treater. 3,905,891, Cl. 204-305.000.

Preussag Aktiengesellschaft: *See—*
Menz, Dieter, 3,906,075.
Prezewowsky, Klaus: *See—*
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.
Price, Edgar E.: *See—*
Harper, David C.; McCrobie, George L.; Price, Edgar E.; and Ritter, Joachim A., 3,905,685.
Pridmore, Lawrence W.: *See—*
Doshi, Chandra P; and Pridmore, Lawrence W., 3,906,418.
Pritulsky, James; Reynolds, Charles Edward; and Wise, Joseph Agusta, to AMP Incorporated. Bivalve housing for electrical terminal. 3,905,475. Cl. 206-330.000.
Procter & Gamble Company, The: *See—*
Ayers, Peter G., 3,905,863.
Production Operators, Inc.: *See—*
Brooks, Walter G.; and Knodle, John P., 3,905,773.
Prokai, Bela, to Union Carbide Corporation. Process for preparation of high resilience polyether urethane foam. 3,905,924, Cl. 2.5 AH.
Prouty, Myron R.: *See—*
Lewis, Dan, Jr.; Von Alven, Raymond D.; and Prouty, Myron R., 3,905,368.
Pysh, Wasyl A., to Techno Corporation. Surge protection valve. 3,905,390, Cl. 137-518.000.
Quasar Electronics Corporation: *See—*
Ivas, Thomas W., 3,906,257.
Ivas, Thomas Wayne, 3,906,150.
Querry, Lester R.; and Stuart, Richard L., to Rixon, Inc. Phase demodulator with phase shifted reference carrier. 3,906,380, Cl. 329-122.000.
Quesnel, Peter Gregory; Lambrou, Andreas; and Walker, Edwin Stanley, to Bush Boake Allen Ltd. Concentrated oleoresin products and emulsification process for preparing them. 3,906,116, Cl. 426-602.000.
Quoss, Robert N.: *See—*
Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., 3,906,513.
R. C. Allen, Inc.: *See—*
Gleason, David I.; and Anderson, Ehnerd H., 3,905,244.
R O Products, Inc.: *See—*
Pitman, Raymond F.; and Dale, William T., 3,906,369.
R. W. Mac Company: *See—*
MacDonnell, Robert W.; and Shander, Otto A., 3,905,307.
Raab, Hans: *See—*
Trattner, Hermann; and Raab, Hans, 3,905,328.
Rachocki, Eugene, to Zurn Industries, Inc. Valve. 3,905,386, Cl. 137-215.000.
Rado, Theodore A.; and Nelson, Thomas C., to Kerr-McGee Chemical Corporation. Purification of ferric chloride. 3,906,077, Cl. 423-149.000.
Raether, Wolfgang: *See—*
Winkelmann, Erhardt; and Raether, Wolfgang, 3,905,985.
Rafferty, John W.: *See—*
Iannazzi, Fred D.; Rafferty, John W.; Sparrow, Donald B.; and Strauss, Richard, 3,906,064.
Rahrig, Donald D.: *See—*
Revells, Robert G.; Rahrig, Donald D.; and Hagedorn, Floyd T., 3,905,794.
Raisin, Jean-Pierre; and Helffer, Bernard, to Centre Technique Industriel dit: Institut Textile de France. Apparatus for detecting defects in needles. 3,905,211, Cl. 66-157.000.
Ralchev, Pencho Ivanov: *See—*
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.
Ralston, Carleton H. Fly swatter. 3,905,146, Cl. 43-137.000.
Ram Research Incorporated: *See—*
Dudley, Irving C., 3,905,363.
Ramacciotti, Aldo: *See—*
Bianchi, Paolo; Ramacciotti, Aldo; and Repetto, Eugenio, 3,905,803.
Ramspeck, Howard B.: *See—*
Novak, Raymond F.; Ramspeck, Howard B.; Geist, Bernard W.; and Potucek, Frank R., 3,905,535.
Randall, David I.; and Wynn, Robert W., to GAF Corporation. 2-Chloroethylphosphonodithioate esters. 3,905,799, Cl. 71-87.000.
Randles, Arthur E. Hollow walled carton structure. 3,905,543, Cl. 229-31.0FS.
Rank Organisation Limited, The: *See—*
Braceley, Michael, 3,906,171.
Cook, Gordon Henry; and Fawcett, John Anthony, 3,905,684.
Rao, Koppaka V.: *See—*
Sobin, Ben A.; Routien, John B.; Rao, Koppaka V.; Marsh, William S.; and Garretson, Aline L., 3,906,093.
Rassbach, Felix; Buttner, Rolf; and Schuck, Stephan, to Hoechst Aktiengesellschaft. Process and apparatus for improving the shape of a stick of longitudinally shirred artificial sausage casing. 3,905,066, Cl. 17-42.000.
Ratowsky, Simon, to Monrick Holdings Limited. Device for liquid processing. 3,905,584, Cl. 259-72.000.
Raymond Lee Organization, Inc., The: *See—*
Arato, George, 3,905,410.
Farkas, John A., 3,905,716.
Kacere, Joseph A., 3,905,323.
Kwong, Luen, 3,905,629.
Raynes, Stephen Henry, to Arthur Guinness Son and Company (Park Royal) Limited. Weigh devices. 3,905,433, Cl. 177-184.000.
Raytheon Company: *See—*
DeMeester, Gordon D.; Barrett, Harrison H.; and Wilson, David T., 3,906,229.
Razdan, Raj Kumar: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Terris, Barbara Zitko, 3,905,969.
RCA Corporation: *See—*
Evans, Wayne Wheeler, 3,906,351.
Floden, Bjorn Fritjof, 3,905,691.
Foldes, Peter, 3,906,508.
Henriques, Frank Fini, 3,906,448.
Kiess, Helmut Gustav, 3,906,501.
Meyerhofer, Dietrich, 3,905,682.
Moe, Douglas Ashworth, 3,906,258.
Roach, William Ronald; and Darcy, Lynne, 3,905,683.
Schade, Horst Ernst Paul, 3,906,277.
Siekanowicz, Wieslaw Wojciech, 3,906,408.
Willis, Donald Henry, 3,906,304.
Recreational Industries Inc.: *See—*
Persico, George J., 3,905,638.
Redifer, James L., to United States of America, Navy. Real-time index register. 3,906,456, Cl. 340-172.500.
Redman, Charles M., to United States of America, Army. Scanner projector system. 3,906,499, Cl. 343-17.700.
Redman, Charles M., to United States of America, Army. Radar target direction simulator. 3,906,500, Cl. 343-17.700.
Redman Fisher Engineering Limited: *See—*
Ord, Walter Desmond, 3,905,304.
Reed F. Blair, Incorporated: *See—*
Blair, Reed F., 3,905,055.
Reeder, William. Unloader elevator with energy means to return the elevator to its loading position. 3,905,496, Cl. 214-128.000.
Rees, Kenneth Rowland: *See—*
Jones, David Thomas; Rees, Kenneth Rowland; and Jowett, George Edward, 3,905,954.
Regie Nationale des Usines Renault: *See—*
Lefebvre, Jean Henri, 3,905,415.
Rivere, Jean-Pierre; Bertuol, Bernard; and Leichle, Claude, 3,906,207.
Rehbock, Ekkehard, to Telefunken Patentverwertungsgesellschaft m.b.H. Electronic proximity fuse incorporating means for preventing premature detonation by electronic counter measures. 3,905,298, Cl. 102-70.20P.
Reimer, Leonard H., to Cessna Aircraft Company, The. Hydrostatic transmission. 3,905,194, Cl. 60-449.000.
Reinhart, Lawrence Walter, to Cincinnati Milacron Inc. Method and apparatus for plasticating polymers. 3,905,588, Cl. 259-191.000.
Reishauer AG: *See—*
Vogelsanger, Emil, 3,905,156.
Reisner, David B.: *See—*
Simon, Edward; Reisner, David B.; Ludwig, Bernard J.; Harakal, John J.; and Kletzkin, Milton, 3,905,977.
Remington Arms Company, Inc.: *See—*
Haskell, Philip R., 3,905,142.
Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; and Laubie, Michel, 3,906,040.
Renk, Richard J.; and Boller, George E., to Miller, Gladys D. Lubricated bearing. 3,905,659, Cl. 308-36.100.
Rentmeester, Kenneth Richard: *See—*
Kaiser, Edward William; and Rentmeester, Kenneth Richard, 3,906,126.
Rentzea, Costin: *See—*
Zeeh, Bernd; Jung, Johann; Rentzea, Costin; and Koenig, Karl-Heinz, 3,905,798.
Repetto, Eugenio: *See—*
Bianchi, Paolo; Ramacciotti, Aldo; and Repetto, Eugenio, 3,905,803.
Repla International S.A.H.: *See—*
de Navas Albareda, Jose Luis, 3,905,062.
Research Corporation: *See—*
Carpino, Louis A.; and Han, Grace Y., 3,906,031.
Olofson, Roy A.; Schnur, Rodney C.; and Bunes, Leonard A., 3,905,981.
Reubke, Karl-Julius; Hohmann, Walter; and Bien, Hans-Samuel, to Bayer Aktiengesellschaft. Process for the manufacturing of nitrohydroxy-anthaquinones. 3,906,013, Cl. 260-383.000.
Reusser, Robert E., to Phillips Petroleum Company. Odor inhibition for paraffin hydrocarbons. 3,905,782, Cl. 44-78.000.
Revells, Robert G.; Rahrig, Donald D.; and Hagedorn, Floyd T., to Libbey-Owens-Ford Company. Glass sheet supporting, shaping and conveying apparatus. 3,905,794, Cl. 65-106.000.
Reynolds, Charles Edward: *See—*
Pritulsky, James; Reynolds, Charles Edward; and Wise, Joseph Agusta, 3,905,475.
Reynolds, Gary R.: *See—*
Beckmann, Robert M.; Lamb, James A.; Nieglos, Donald J.; and Reynolds, Gary R., 3,906,445.
Reynolds, Nigel J. E.: *See—*
Brenski, Edwin F.; Draayer, Jan; Reynolds, Nigel J. E.; and Risky, Frank A., 3,906,163.

Rhodes, Robert H., to Zenith Radio Corporation. Potentiometer wiper assembly. 3,906,429, Cl. 338-202.000.
Rhone-Poulenc S.A.: *See—*
Belloc, Andre; Florent, Jean; Mancy, Denise; and Verrier, Jean, 3,906,113.
Rice, James Sloan: *See—*
Albert, Kenneth J.; and Rice, James Sloan, 3,905,512.
Rice, Martin A.: *See—*
Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., 3,905,809.
Richardson, Henry Allan; and Sellari, Daniele, Jr., to International Telephone and Telegraph Corporation. Limiter circuit. 3,906,365, Cl. 328-31.000.
Richardson-Merrell Inc.: *See—*
Albrecht, William L.; and Fleming, Robert W., 3,906,007.
Richardson, Roy A.: *See—*
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.
Richmond, James W., to Stryker Corporation. Combined cabinet and table. 3,905,662, Cl. 312-250.000.
Ricks, Tom E.; and Sherman, Albert Jack. Magnetic fishing tool. 3,905,631, Cl. 294-65.500.
Ricoh Co., Ltd.: *See—*
Kimura, Tsuguo; Soga, Setsuo; and Watanabe, Toshio, 3,905,331.
Koizumi, Masami; and Yamauchi, Satoshi, 3,905,128.
Sawada, Hideo; Hirafuji, Van; and Komada, Kenya, 3,905,332.
Takahashi, Akira, 3,906,292.
Rigdon, James W.; Ifune, Saburo; and Graber, LeRoy D., to Seiscom Delta Inc. Satellite positioning apparatus. 3,906,204, Cl. 235-150.270.
Riise, Kjell: *See—*
Kjellberg, Leif Roland; Riise, Kjell; and Svensson, Per-Olov, 3,906,318.
Riley, Kenneth L.; House, William T.; and Hofmann, John E., to Exxon Research and Engineering Company. Process for preparing a hydrotreating catalyst. 3,905,916, Cl. 252-453.000.
Rindelaub, Frank A. E.: *See—*
Friedrich, Richard; and Rindelaub, Frank A. E., 3,905,517.
Risky, Frank A.: *See—*
Brenski, Edwin F.; Draayer, Jan; Reynolds, Nigel J. E.; and Risky, Frank A., 3,906,163.
Ritter, Joachim A.: *See—*
Harper, David C.; McCrobie, George L.; Price, Edgar E.; and Ritter, Joachim A., 3,905,685.
Rivera de Campos, Edith: *See—*
Ordonez, Raul Poblano; Rosado, Antonio Acuna; Petrirena, Francisco Garaicochea; and Rivera de Campos, Edith, 3,905,826.
Rivere, Jean-Pierre; Bertuol, Bernard; and Leichle, Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Control system of the analogue-digital-analogue type with a digital computer having multiple functions for an automobile vehicle. 3,906,207, Cl. 235-150.200.
Rixon, Inc.: *See—*
Querry, Lester R.; and Stuart, Richard L., 3,906,380.
Rixson-Firemark, Inc.: *See—*
Coulter, Gordon L.; and Pearsall, Duane D., 3,905,063.
Roach, William Ronald; and Darcy, Lynne, to RCA Corporation. Deformable mirror light valve for real time operation. 3,905,683, Cl. 350-161.000.
Robbins, Douglas A.: *See—*
Desmonds, Daniel J.; Tate, Donald P.; and Robbins, Douglas A., 3,906,459.
Robert Bosch G.m.b.H.: *See—*
Schwerin, Gunther, 3,905,383.
Roberts, George W., to Allis-Chalmers Corporation. Crankshaft bearing measuring apparatus. 3,905,116, Cl. 33-174.00L.
Roberts, Joseph G.: *See—*
Irwin, Philip G.; McNaughtan, Thomas J.; and Roberts, Joseph G., 3,905,935.
Roberts, Marvin E., to Locking Systems, Inc. Removable core differential mechanism. 3,905,213, Cl. 70-368.000.
Roberts, Norman D.: *See—*
Smith, Lawrence W., Jr.; and Roberts, Norman D., 3,905,233.
Robertshaw Controls Company: *See—*
Branson, Charles D., 3,905,747.
Cairo, Anthony C.; and Holkeboer, Ronald E., 3,905,748.
Rockwell, Albert M., Jr.: *See—*
Barraco, Anthony J.; and Rockwell, Albert M., Jr., 3,906,276.
Rockwell International Corporation: *See—*
Baker, Kenneth Vincent, 3,905,283.
Bass, Larry F., 3,906,376.
Dennison, Charles M.; and Hogue, Noel E., 3,906,375.
Stephens, Thomas C., 3,906,503.
Washschynsky, Bohdan; and Stone, Rex D., 3,905,296.
Rodgers, Daniel L.; and Cater, Thomas F., to King Radio Corporation. Avionics display having a rotary solenoid actuator therein. 3,906,420, Cl. 335-272.000.
Roehm, Dan Christian. Blood clotting depressant therapy. 3,906,109, Cl. 424-325.000.
Roger, Joseph, to Thomson-CSF. Radar system for detecting low-flying objects. 3,906,495, Cl. 343-7.00A.
Rogers, James B., to Marion Power Shovel Company, Inc. Cable connecting assembly. 3,905,711, Cl. 403-16.000.
Rogers, Robert M., to Hobart Corporation. Computing scale system. 3,906,208, Cl. 235-151.330.
Rohm GmbH: *See—*
Bauer, Peter, 3,906,137.
Rokadia, Abdullah M.; and Gaske, Joseph E., to De Sota, Inc. Avoidance of spattering in the supply of conductive liquids to charged reservoirs. 3,905,550, Cl. 239-15.000.
Rollett, John Mortimer, to Post Office, The. Transfer function control networks. 3,906,390, Cl. 330-107.000.
Rolls-Royce (1971) Limited: *See—*
Guy, Kenneth Ronald; Dennis, Harry; and Hood, Robert Burns, 3,905,722.
Romeo, David J., to Calspan Corporation. Ski binding. 3,905,613, Cl. 280-11.35R.
Rosado, Antonio Acuna: *See—*
Ordonez, Raul Poblano; Rosado, Antonio Acuna; Petrirena, Francisco Garaicochea; and Rivera de Campos, Edith, 3,905,826.
Rosborg, Daniel J.: *See—*
Frechette, Thomas E.; and Rosborg, Daniel J., 3,905,464.
Frechette, Thomas E.; and Rosborg, Daniel J., 3,905,465.
Rosell, Jorge Estela, to Bendeberica S.A. Servo-assisted steering mechanism. 3,905,277, Cl. 91-400.000.
Rosemount Inc.: *See—*
Grindheim, Earl A., 3,906,338.
Rosendahl, Jean F. Mist-oxygen therapy cribliner tent. 3,905,056, Cl. 5-97.000.
Ross, Elizabeth T., executrix: *See—*
Ross, Walter T., deceased, 3,905,446.
Ross, Walter T., deceased (by Ross, Elizabeth T., executrix), to Western Geophysical Company of America. Self-propelled seismic signal generator. 3,905,446, Cl. 181-114.000.
Rossi, Anthony T. Decorating machine with timed ink dispenser. 3,905,292, Cl. 101-40.000.
Roth, Fred S., to Monsanto Company. Filter. 3,905,787, Cl. 55-488.000.
Roussel-UCLAF: *See—*
Bucourt, Robert; Pierdet, Andre; and Salmon, Jean, 3,906,096.
Martel, Jacques; and Heymes, Rene, 3,905,965.
Perronnet, Jacques; and Teche, Andre, 3,905,996.
Routien, John B.: *See—*
Sobin, Ben A.; Routien, John B.; Rao, Koppaka V.; Marsh, William S.; and Garretson, Aline L., 3,906,093.
Rouvin, Maxime Jean; Rouvin, Paul Fernand; and Rouvin, Philippe Edmond. Extrusion press for making hollow concrete bodies. 3,905,732, Cl. 425-85.000.
Rouvin, Paul Fernand: *See—*
Rouvin, Maxime Jean; Rouvin, Paul Fernand; and Rouvin, Philippe Edmond, 3,905,732.
Rouvin, Philippe Edmond: *See—*
Rouvin, Maxime Jean; Rouvin, Paul Fernand; and Rouvin, Philippe Edmond, 3,905,732.
Rovac Corporation, The: *See—*
Edwards, Thomas C., 3,905,204.
Roy, Kurt: *See—*
Schlangenotto, Heinrich; and Roy, Kurt, 3,906,545.
Royal Industries, Inc.: *See—*
Fritz, Alton L., 3,905,861.
McKenney, John D., 3,905,160.
Ruben, Paul Lewis, to Eastman Kodak Company. Three element projection lens. 3,905,686, Cl. 350-189.000.
Rubenstein, Kenneth E.; and Ullman, Edwin F., to Syva Company. Lactam conjugates to enzymes. 3,905,871, Cl. 195-63.000.
Rubin, Jacob C.; and Swapceinski, John P., to Eastman Kodak Company. Powder level monitor. 3,906,475, Cl. 340-246.000.
Ruell, Hartwig; and Storck, Eckhard, to Siemens Aktiengesellschaft. Apparatus for producing one-dimensional holograms. 3,905,674, Cl. 350-3.500.
Ruf, Max, to Audi Nsu Auto Union Aktiengesellschaft; and Wankel G.m.b.H. Interior seal for the piston of a rotary piston engine. 3,905,730, Cl. 418-142.000.
Ruggiero, Edward M., to Displaytek Corporation. Thermal display module. 3,905,094, Cl. 29-577.000.
Runshang, Anthony A., to AMF Incorporated. Method and apparatus for testing an object for flaws consisting of two sensors spaced apart along the object path and each connected to a common marker. 3,906,357, Cl. 324-37.000.
Runyon, F. Sheldon; Strantz, Lawrence D.; Webb, Darryl S.; and Phenix, Charles E., to Westinghouse Air Brake Company. Hydraulic steering system for off-highway vehicle. 3,905,438, Cl. 180-79.20R.
Russell, Gary R.: *See—*
United States of America, National Aeronautics and Space Administration; Russell, Gary R.; Nerheim, Noble M.; and Pivirotto, Thomas J., 3,906,398.
Rutty, Edward C., to Stanley Works, The. Smiley coilable rule with automatic recoil speed control. 3,905,114, Cl. 33-138.000.
Ryan, John J. Stratified charge system. 3,905,343, Cl. 123-75.00B.
Ryu, Dewey D. Y.: *See—*
Lee, Bong Kuk; Ryu, Dewey D. Y.; Miraglia, Gennaro John; Basch, Harold I.; and Mukherjee, Barid B., 3,905,955.
Saco-Lowell Corporation: *See—*
Harmon, Albert D.; Martin, Charles R.; and Drake, William H., 3,905,186.
Harmon, Albert D.; Martin, Charles R.; and Cleland, Luther A., Jr., 3,905,187.
Saffren, Melvin M.: *See—*
United States of America, National Aeronautics and Space Administration; and Saffren, Melvin M., 3,906,231.

Safir, Sidney Robert: *See—*
Fanshawe, William Joseph; and Safir, Sidney Robert, 3,906,097.

Sahling, La Monte H.: *See—*
Ahlers, William H.; Derr, Robert E.; and Sahling, La Monte H., 3,905,523.

Saida, Youichi; Ito, Hajime; and Imanaga, Kojiro, to Mitsubishi Kinzou Kogyo Kabushiki Kaisha. Hydraulic control valve for rotary servomechanism. 3,905,275, Cl. 91-375.00R.

Saito, Kazuo: *See—*
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Saito, Takahiko: *See—*
Iwase, Koichi; Saito, Takahiko; and Tanaka, Schosuke, 3,906,169.

Sakaguchi, Mitsuhito: *See—*
Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, 3,906,465.

Sakai, Naomi: *See—*
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.

Sakanishi, Kenji: *See—*
Igarashi, Hiroshi; Kawaguchi, Toshiyuki; and Sakanishi, Kenji, 3,905,240.

Sakurai, Kiyomi; Fukushima, Yutaka; and Takimoto, Yasuyuki, to Nippon Paint Co., Ltd. Photopolymer printing plate improved in water resistance and its preparation. 3,905,819, Cl. 96-35.100.

Salamon, Klaus; Busch, Heinrich; and Zander, Eberhard, to Varta Batterie A.G. Operation of multicell traction batteries. 3,906,330, Cl. 320-46.000.

Salihi, Jalal Tawfiq. Direct current motors. 3,906,321, Cl. 318-439.000.

Sallo, Richard L.: *See—*
Bengel, Thomas G.; Sallo, Richard L.; and Stricker, Charles D., 3,905,885.

Salmon, Jean: *See—*
Bucourt, Robert; Pierdet, Andre; and Salmon, Jean, 3,906,096.

Salmon, Marion, to Ing. C. Olivetti & C., S.p.A. Adaptive feeling apparatus for determining a prearranged position in which a part is to be fitted. 3,906,325, Cl. 318-569.000.

Salvagni, Edward A.: *See—*
Nicholas, John F.; and Salvagni, Edward A., 3,906,259.

Samuel Moore & Company: *See—*
Johansen, Hans A.; Phillippi, Larry R.; and Green, Edward A., 3,905,398.

Sandor, Vasile; and Kolozsvari, Zoltan, to Intreprinderea Industriala de Stat Methalothehnica. Apparatus for measuring the dissociation ratio of ammonia. 3,905,771, Cl. 23-254.00E.

Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 3,905,976.

Sandoz Ltd.: *See—*
Hofer, Kurt; Moesch, Rudolf; Schilli, Alfred; and Burdet, Evelyne, 3,906,041.
Schneider, Rupert, 3,905,968.

Sandvik Aktiebolag: *See—*
Wirfelt, Sven Axel Olof, 3,905,081.

Sanford, Chester E.: *See—*
Townsend, John K.; and Sanford, Chester E., 3,905,858.

Sangster, John H.: *See—*
Cooper, Martin; Dronsuth, Richard W.; Mikulski, Albert J.; Lynk, Charles N., Jr.; Mikulski, James J.; Mitchell, John F.; Richardson, Roy A.; and Sangster, John H., 3,906,166.

Sankyo Organic Chemicals Co., Ltd.: *See—*
Itoh, Yoshio; Itsukaichi, Yoshitoshi; and Kuroi, Fumiaki, 3,905,933.

Santoro, Jules C.: *See—*
Lawrence, John E.; and Santoro, Jules C., 3,905,162.

Sargent, Eugene W.: *See—*
Madonna, John M., Jr.; and Sargent, Eugene W., 3,905,602.

Sasabe, Toshio: *See—*
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.

Sasai, Kazuyoshi: *See—*
Yoshida, Hiroshi; Sasai, Kazuyoshi; and Kubomatsu, Teruo, 3,906,046.

Sasaki, Hiroshi. Synchronous drive system and embroidering machine employing the same. 3,905,315, Cl. 112-86.000.

Sasaki, Mamoru: *See—*
Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, 3,905,866.

Sasatani, Tadashi: *See—*
Mino, Hiroshi; Sasatani, Tadashi; and Kobayashi, Tadaki, 3,905,217.

Sato, Hiromi: *See—*
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, 3,906,003.

Satou, Haruhiko: *See—*
Shimoji, Masaharu; and Satou, Haruhiko, 3,905,337.

Satzinger, Gerhard; and Herrmann, Manfred, to Warner-Lambert Company. 4R-amino-1t-phenyl-1c-ethoxycarbonyl-cyclohexenes-(2) and process for their preparation. 3,905,978, Cl. 260-268.0PH.

Sauermann, Heinz; and Winkler, Gerhard, to U.S. Philips Corporation. Capacitance diode having a large capacitance ratio. 3,906,539, Cl. 357-14.000.

Sauter, Richard S.: *See—*
Gerner, Daniel F.; and Sauter, Richard S., 3,905,479.

Sav-A-Life Corporation: *See—*
Guadara, Joseph G.; and Wesserling, William R., 3,906,472.

Savage, Michael Philip: *See—*
Hoyle, William; and Savage, Michael Philip, 3,906,101.

Savoie, Robert Ellis: *See—*
Crane, Hewitt David; and Savoie, Robert Ellis, 3,906,444.

Sawada, Hideo; Hirafuji, Van; and Komada, Kenya, to Ricoh Co., Ltd. Electrophotographic developing apparatus using developing roller. 3,905,332, Cl. 118-637.000.

Sawada, Yasunori: *See—*
Toyoshima, Sakae; and Sawada, Yasunori, 3,906,526.

Schade, Franz; and Nebeling, Reinhard, to Bayer Aktiengesellschaft. Formaldehyde condensation products of terphenyl-sulphonic acids. 3,906,037, Cl. 260-505.00C.

Schade, Horst Ernst Paul, to RCA Corporation. Electron tube having a semiconductor coated metal anode electrode to prevent electron bombardment stimulated desorption of contaminants therefrom. 3,906,277, Cl. 313-365.000.

Schaefer, Willi: *See—*
Schorr, Hermann; Schaefer, Willi; Finkenzeller, Johann; and Wittkopp, Fritz, 3,905,591.

Schaffer, Bernhard: *See—*
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.

Scharton, Terry D., to Bolt Beranek and Newman Inc. Vortex turbulence noise generation suppressor. 3,905,445, Cl. 181-46.000.

Schatter, Eckart; and Kriedt, Hans, to Siemens Aktiengesellschaft. Circuit arrangement for automatic frequency fine tuning in radio and television receivers. 3,906,372, Cl. 325-418.000.

Schayes, Raymond Georges; Gustin, Pol Ambroise Ghislain Joseph; and Schmitz, Jean Fernand Raymond, to U.S. Philips Corporation. Arc generator for an emission spectrometer. 3,906,291, Cl. 315-171.000.

Schempp, Eberhard G.; Pearce, Jai K.; and Schroeder, David L., to Pennsylvania Engineering Corporation. Steel production method and apparatus. 3,905,589, Cl. 266-35.000.

Schenk, Peter: *See—*
Dzus, Theodore; and Schenk, Peter, 3,905,411.

Schering Aktiengesellschaft: *See—*
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.

Schiffman, Murray M., to Cambridge Research and Development Group; Greenberg, Sanford D.; DT Liquidating Partnership; and Schiffman, Murray M. System for nullifying signal processor distortions. 3,906,384, Cl. 328-165.000.

Schilli, Alfred: *See—*
Hofer, Kurt; Moesch, Rudolf; Schilli, Alfred; and Burdet, Evelyne, 3,906,041.

Schirmer, Ernest J., to Westinghouse Electric Corporation. Elevator system with guide rail cleaning devices. 3,905,452, Cl. 187-1.00R.

Schlachter, Fredo: *See—*
Keib, Heinz; and Schlachter, Fredo, 3,905,067.

Schlangenotto, Heinrich; and Roy, Kurt, to Licentia Patent-Verwaltungs-G.m.b.H. Thyristor structure. 3,906,545, Cl. 357-38.000.

Schlatter, Rudolph; and Adams, Charles De Witt, to Du Pont de Nemours, E. I., and Company. 2-Benzimidazolecarbamic acid esters by the cyanamide process. 3,905,991, Cl. 260-309.200.

Schlichte, Max, to Siemens Aktiengesellschaft. Method for switching pulse code modulated signals using time-division multiplex principles. 3,906,161, Cl. 179-15.0AQ.

Schlichte, Max, to Siemens Aktiengesellschaft. Digital-to-analog converter. 3,906,489, Cl. 340-347.0DA.

Schlumberger Technology Corporation: *See—*
Nicolas, Yves, 3,905,226.

Schmehl, Glenn Lewis, to Western Electric Company, Incorporated. Method and apparatus for compensating for substance variations during lead frame bonding. 3,905,537, Cl. 228-180.000.

Schmid, Lothar: *See—*
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.

Schmidt-Kastner, Gunther: *See—*
Kutzbach, Carl; and Schmidt-Kastner, Gunther, 3,905,870.

Schmitz, Jean Fernand Raymond: *See—*
Schayes, Raymond Georges; Gustin, Pol Ambroise Ghislain Joseph; and Schmitz, Jean Fernand Raymond, 3,906,291.

Schmookler, Michael. Passive range computer. 3,906,189, Cl. 235-61.50S.

Schneider, Ernst; Simon, Manfred; Weiss, Richard; Hover, Alexander; and Treutler, Christian, to Dynamit Nobel Aktiengesellschaft. Process for the production of shaped, marbled thermoplastic products. 3,906,065, Cl. 264-40.000.

Schneider, Rupert, to Sandoz Ltd. Preparation of 1,2-dichloro-3-amino propane derivatives. 3,905,968, Cl. 260-247.000.

Schnettler, Richard A.; and Suh, John T., to Colgate-Palmolive Company. 3-Substituted-2,4-dihydro-benzodiazepines. 3,905,980, Cl. 260-268.0BC.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, 3,906,014.

Schnur, Rodney C.: *See*—
Olofson, Roy A.; Schnur, Rodney C.; and Bunes, Leonard A., 3,905,981.

Schoenberger, Eberhard: *See*—
Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, 3,905,420.

Scholz, Donald T., to Polaroid Corporation. Film guided playback and recording mechanism. 3,905,690, Cl. 352-27.000.

Schon, Franz: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,905,764.

Schorr, Hermann; Schaefer, Willi; Finkenzeller, Johann; and Wittkopp, Fritz, to Siemens Aktiengesellschaft. Patient's couch. 3,905,591, Cl. 269-328.000.

Schottey, Jean: *See*—
Plumat, Emile; Schottey, Jean; and Toussaint, Francois, 3,905,791.

Schowalter, Kenneth A.; and Hunter, Richard H., to United States Steel Corporation. Recycling of ferromanganese precipitator dusts. 3,905,805, Cl. 75-25.000.

Schrecongost, Ray B., to Hammond Corporation. Low inertia tremolo unit. 3,905,447, Cl. 181-143.000.

Schroeder, David L.: *See*—
Schempp, Eberhard G.; Pearce, Jai K.; and Schroeder, David L., 3,905,589.

Schroer Manufacturing Company: *See*—
Uhrig, Charles L., 3,905,333.

Schroter, Herbert; and Dennhardt, Werner, to Hoechst Aktiengesellschaft. Photoprinting apparatus in which developer is replenished in proportion to the treated surface area. 3,905,698, Cl. 355-27.000.

Schuchmann, Dieter: *See*—
Deubel, Karl; Weber, Willi; and Schuchmann, Dieter, 3,905,206.

Schuck, Stephan: *See*—
Rassbach, Felix; Buttner, Rolf; and Schuck, Stephan, 3,905,066.

Schuh, Eduard: *See*—
Kelch, Heinz; Kirchgessner, Hilmar; and Schuh, Eduard, 3,905,561.

Schuh, Frank J., to Atlantic Richfield Company. Tension-leg platform. 3,905,319, Cl. 114-.50D.

Schuhmacher, Alfred; and Schwantje, Gerd, to BASF Aktiengesellschaft. Production of 1-aminoanthraquinone-2-carboxamides. 3,906,012, Cl. 260-377.000.

Schulman, Marvin, to United States of America, Navy. Inflatable body and head restraint. 3,905,615, Cl. 280-150.0AB.

Schulz, Werner: *See*—
Sirrenberg, Walter; Bauer, Rudolf; Schulz, Werner; and Banholzer, Rolf, 3,905,957.

Schumacher, Neal P.: *See*—
Taft, Donald L.; Smith, Victor W.; and Schumacher, Neal P., 3,905,202.

Schuster, Rolf, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Conveying apparatus for heat treatment furnaces. 3,905,472, Cl. 198-203.000.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-(5-Nitro-2-furyl)-5-chloropyrimidine. 3,905,975, Cl. 260-251.00R.

Schwantje, Gerd: *See*—
Schuhmacher, Alfred; and Schwantje, Gerd, 3,906,012.

Schwartz, Alfred Alexander; and Stewart, Joseph Robert, to International Business Machines Corporation. Digital television display system employing coded vector graphics. 3,906,480, Cl. 340-324.0AD.

Schwarz, Frederick P.: *See*—
Okabe, Hideo; and Schwarz, Frederick P., 3,906,226.

Schweitzer, Edmund O., Jr. Fault indicator in test point cap. 3,906,477, Cl. 340-253.00A.

Schwerdtel, Wulf: *See*—
Kronig, Walter; and Schwerdtel, Wulf, 3,905,875.

Schwerin, Gunther, to Robert Bosch G.m.b.H. Hydraulic control device. 3,905,383, Cl. 137-110.000.

Science Union et Cie, Society Francaise de Recherche Medicale: *See*—
Vincent, Michel; Remond, Georges; and Laubie, Michel, 3,906,040.

SCM Corporation: *See*—
Gawrilow, Ilija, 3,906,117.
Uher, Joseph F., 3,906,125.

Scordato, Emil A.: *See*—
Hartnett, John J.; Cohen, Jules Barry; and Scordato, Emil A., 3,905,772.

Scott, Alan: *See*—
Donley, Michael J., 3,905,622.

Scott, Hubert Dunkerley; and Smith, Michael Paul, to Texaco Inc. Dual spaced epithermal neutron detector porosity logging with AcBe source. 3,906,224, Cl. 250-264.000.

Scott, William W., Jr., to Lukens Steel Company. Method of decarburization of slag in the electroslag remelting process. 3,905,804, Cl. 75-11.000.

Scully Signal Company: *See*—
Wisnia, Jeffry A., 3,905,516.

Sebag, Henri: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 3,906,048.

Seckinger, Hans: *See*—
Siefert, Roland; Seckinger, Hans; and Krosche, Herbert, 3,905,189.

Sedore, James: *See*—
Watkins, Berne A.; and Sedore, James, 3,905,167.

See, Gary G.; and Gardner, Joseph G., to Addressograph Multigraph Corporation. Plate feed mechanism. 3,905,293, Cl. 101-56.000.

Seeger, Walter; and Lamparth, Fritz. Door or window mounting. 3,905,065, Cl. 16-163.000.

Segerstrom, Kjell Erik Lennart, to C J Wennberg AB. Arrangement for the separation of objects suspended in batches, primarily anodes and cathodes for electrolytic metal refining. 3,905,468, Cl. 198-34.000.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Feedforward error correction in interferometer modulators. 3,906,401, Cl. 332-18.000.

Seiscom Delta Inc.: *See*—
Rigdon, James W.; Ifune, Saburo; and Graber, LeRoy D., 3,906,204.

Sekine, Yoichi: *See*—
Yoshino, Kimiaki; Adachi, Kinichi; Shimotsuma, Wataru; Sekine, Yoichi; and Shimizu, Toshio, 3,905,876.

Sell, James F. Lantern igniter. 3,905,750, Cl. 431-142.000.

Sellari, Daniele, Jr.: *See*—
Richardson, Henry Allan; and Sellari, Daniele, Jr., 3,906,365.

Serras-Paulet, Edouard, to Neophone Equipment. Push-button with multiple electroconductive contacts returned to rest position by a magnetic device. 3,906,417, Cl. 335-205.000.

Sethre, Vernon C.: *See*—
Downing, James W.; Fernandez, Carlos P.; and Sethre, Vernon C., 3,905,241.

Seymour, Donald E.: *See*—
Kunkel, Donald H.; and Seymour, Donald E., 3,905,797.

Shander, Otto A.: *See*—
MacDonnell, Robert W.; and Shander, Otto A., 3,905,307.

Shank, Charles Vernon: *See*—
Dienes, Andrew; Shank, Charles Vernon; and Trozzolo, Anthony Marion, 3,906,399.

Sharps Associates: *See*—
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Terris, Barbara Zitko, 3,905,969.

Shavel, John, Jr.: *See*—
Wittekind, Raymond R.; and Shavel, John, Jr., 3,905,992.

Shaw, Charles W., to Sparton Corporation. Electric horn. 3,906,490, Cl. 340-388.000.

Shaw, Herbert J., to United States of America, Navy. Acoustic device for measuring rotation rates. 3,905,235, Cl. 73-505.000.

Shaw, Robert F. Fishhook leader standoff. 3,905,144, Cl. 43-42.740.

Shawhan, Elbert N., to Sun Oil Company of Pennsylvania. High side meter. 3,906,471, Cl. 340-200.000.

Shawver, Bruce M.: *See*—
Johnson, Melvin L.; and Shawver, Bruce M., 3,905,634.

Shea, Dennis W., to Dana Corporation. Trans-axle with integral braking. 3,905,457, Cl. 192-5.000.

Shell Oil Company: *See*—
Vervloet, Christiaan, 3,905,925.

Shellman, Carl E.: *See*—
Week, Nils P.; Shellman, Carl E.; and Koivunen, Erkki A., 3,905,274.

Shen, Michael T. Graded junction varactor frequency divider circuits employing large division factors. 3,906,245, Cl. 307-225.00R.

Shepherd, John W., to Becton, Dickinson and Company. Disposable surgical scalpel. 3,905,101, Cl. 30-162.000.

Shepherd, Norris Wilfred: *See*—
Gateshill, Henry Charles; and Shepherd, Norris Wilfred, 3,905,555.

Sherman, Albert Jack: *See*—
Ricks, Tom E.; and Sherman, Albert Jack, 3,905,631.

Sherman, Perry: *See*—
Greenwald, Harry; and Sherman, Perry, 3,905,460.

Sherman & Reilly, Inc.: *See*—
Chadwick, William H., Jr., 3,905,581.

Sherritt Gordon Mines Limited: *See*—
Gulyas, James W.; and Vydra, Charles, 3,905,900.

Sherwood, Robert D.: *See*—
Cudahy, Michael J.; and Sherwood, Robert D., 3,905,364.

Shibata, Uichi: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Shibuya, Yukio: *See*—
Ohshima, Iwao; Chiba, Seiichi; Shibuya, Yukio; and Ishikawa, Haruhiko, 3,905,122.

Shichida, Hiromichi; Toyoda, Kenichi; and Irie, Seiji, to Fujitsu Ltd.; and Fujitsu Fanuc Limited. Two-axis magnetic positioning device. 3,906,262, Cl. 310-12.000.

Shiga, Shoji, to Furukawa Electric Co., Ltd., The. Solutions for chemical dissolution treatment of metal materials. 3,905,907, Cl. 252-79.400.

Shikov, Todor Vassilev: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Shimizu, Takafumi: *See*—
Miyamoto, Bunichi; Tanishima, Yasuo; and Shimizu, Takafumi, 3,906,382.

Shimizu, Toshio: *See*—
Yoshino, Kimiaki; Adachi, Kinichi; Shimotsuma, Wataru; Sekine, Yoichi; and Shimizu, Toshio, 3,905,876.

Shimizu, Yoshiaki: *See—*
Yoshikawa, Motohiko; Shimizu, Yoshiaki; Tanaka, Yoshiharu; and Ishii, Kazuo, 3,905,964.

Shimoji, Masaharu; and Satou, Haruhiko, to Toyo Kogyo Co., Ltd. Fuel injection type rotary piston engine. 3,905,337, Cl. 123-8.090.

Shimotsuma, Wataru: *See—*
Yoshino, Kimiaki; Adachi, Kinichi; Shimotsuma, Wataru; Sekine, Yoichi; and Shimizu, Toshio, 3,905,876.

Shiner, Robert L.: *See—*
Palatnick, Leonard; and Shiner, Robert L., 3,905,254.

Shippey, Carlyle E., Jr.: *See—*
Clearwaters, Walter L.; Kingsbury, Frederick J.; Shippey, Carlyle E., Jr.; and Soderberg, John W., 3,906,431.

Shiraishi, Keiichi: *See—*
Yagi, Eigo; and Shiraishi, Keiichi, 3,906,238.

Shiraishi, Tadashi; and Yamanaka, Tadashi, to Matsushita Electric Industrial Co., Ltd. Method of making a PN junction device by metal dot alloying and recrystallization. 3,905,844, Cl. 148-177.000.

Shirasaki, Takayuki, to Canon Kabushiki Kaisha. Device for mounting and dismounting an interchangeable lens. 3,906,534, Cl. 354-286.000.

Shirk, Ivan A.: *See—*
Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., 3,905,784.

Shiroyama Kogyo Kabushiki Kaisha: *See—*
Ohnaka, Makoto, 3,905,569.

Shook, Gerald, to Shyodu Precision Instrument Company. Machine tool assembly. 3,905,273, Cl. 90-11.00R.

Shoot, Lyle E.; and Lambermont, John, to P. R. Mallory & Co. Inc. Metal-to-glass-to-ceramic seal. 3,906,311, Cl. 317-230.000.

Short, Joe T., to Deering Milliken Research Corporation. Bonded carpet machine. 3,905,857, Cl. 156-435.000.

Showers, John Walter: *See—*
Boggs, Beryl Aaron; Cooksey, James Judson; Newell, Harry Lee, Jr.; and Showers, John Walter, 3,905,075.

Shulzhenko, Alexandr Alexandrovich; and Getman, Anatoly Fedorovich. Method of making diamonds synthetically. 3,906,082, Cl. 423-446.000.

Shumaker, Charles Storer, to Wean United, Inc. Roll changing device for a rolling mill and the like. 3,905,485, Cl. 214-1.00D.

Shyodu Precision Instrument Company: *See—*
Shook, Gerald, 3,905,273.

Sibgatulin, Kharis Malikovich: *See—*
Lepp, Vladimir Romanovich; Vinogradov, Vladimir Alexeevich; Sibgatulin, Kharis Malikovich; and Cherkasov, Jury Nikolaevich, 3,906,289.

Siddall, John B.: *See—*
Henrick, Clive A.; and Siddall, John B., 3,906,020.

Sidorov, Ivan Nikolaevich: *See—*
Vlasov, Pavel Semenovich; Ivanov, Alexandr Karlovich; Svechnikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich, 3,905,546.

Siefert, Roland; Seckinger, Hans; and Krosche, Herbert, to Kienzle Uhrenfabriken G.m.b.H. Mechanical improvement on an alarm clock. 3,905,189, Cl. 58-56.000.

Siegelman, Abe; Quoss, Robert N.; and Pawlak, Raymond M., to Beckman Instruments, Inc. Low-pressure inking system. 3,906,513, Cl. 346-140.000.

Siekanowicz, Wieslaw Wojciech, to RCA Corporation. Frequency translator using gyromagnetic material. 3,906,408, Cl. 333-24.100.

Siemens Aktiengesellschaft: *See—*
Conrad, Bernhard; and Heinzelmann, Karl-Georg, 3,906,234.
Dull, Hans-Jurgen, 3,905,303.
Feldtkeller, Ernst, 3,906,343.
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.
Hashoff, Lothar; Luxa, Gunther; Thurk, Joachim; and Diessner, Armin, 3,906,149.
Kohnert, Dietrich, 3,906,438.
Lange, Gottfried, 3,906,228.
Lechner, Ernst-Friedrich, 3,905,671.
Lutz, Karl-Anton, 3,906,159.
Moder, Hans-Ulrich, 3,906,452.
Poguntke, Dieter, 3,906,212.
Ruell, Hartwig; and Storck, Eckhard, 3,905,674.
Schatter, Eckart; and Kriedt, Hans, 3,906,372.
Schlichte, Max, 3,906,161.
Schlichte, Max, 3,906,489.
Schorr, Hermann; Schaefer, Willi; Finkenzeller, Johann; and Wittkopp, Fritz, 3,905,591.
Trattner, Hermann; and Raab, Hans, 3,905,328.
Wimmer, Josef, 3,906,421.

Siems, Lee E., to Digital Data Systems, Inc. Digital AGC for playback of digitally recorded data. 3,906,487, Cl. 340-347.0DA.

Siepmann, Reiner: *See—*
Mai, Gerhard; and Siepmann, Reiner, 3,905,918.

Sieuzac, Jean Louis. Walls with resonant cavities. 3,905,443, Cl. 181-33.00G.

Sigg, Hans, to Maag Gear-Wheel & Machine Co., Ltd. Gear assemblies. 3,905,250, Cl. 74-665.00B.

Silicon Material, Inc.: *See—*
Lawrence, John E.; and Santoro, Jules C., 3,905,162.

Silver, H. Graham; Gardner, Phillip J.; Heller, Adam; and Argue, Gary R., to GTE Laboratories Inc. Electrode discharge device with electrode-activating fill. 3,906,274, Cl. 313-228.000.

Silver, Robert H.: *See—*
United States of America, National Aeronautics and Space Administration; Silver, Robert H.; Lewis, Gilbert W.; Feldstein, Cyril; and Duran, Edward N., 3,905,356.

Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., to Union Corporation. Sustained release of methantheline. 3,906,087, Cl. 424-22.000.

Simjian, Luther G. Chair with moving seat and mirror. 3,905,642, Cl. 297-185.000.

Simon, Edward; Reisner, David B.; Ludwig, Bernard J.; Harakal, John J.; and Kletzkin, Milton, to Carter-Wallace, Inc. Octahydromorphanthridines. 3,905,977, Cl. 260-239.00D.

Simon, Manfred: *See—*
Schneider, Ernst; Simon, Manfred; Weiss, Richard; Hover, Alexander; and Treutler, Christian, 3,906,065.

Simonetti, Alexander, to International Business Machines Corporation. Method of improving dispersability of small metallic magnetic particles in organic resin binders. 3,905,841, Cl. 148-105.000.

Simons, Charles William: *See—*
Billings, Charles Alden; O'Neill, Gerald Joseph; and Simons, Charles William, 3,906,111.

Simonsen, Roger H.: *See—*
Houston, George B.; and Simonsen, Roger H., 3,906,455.

Simplicity Engineering Company: *See—*
Jacobson, Wayne D., 3,905,897.

Sinclair, William Y.: *See—*
Crimmins, David J.; and Sinclair, William Y., 3,905,667.

Sir Robert McAlpine & Sons Limited: *See—*
Bland, John, 3,905,645.

Sirrenberg, Walter; Bauer, Rudolf; Schulz, Werner; and Banholzer, Rolf, to Boehringer Ingelheim GmbH. 3-Aryl-5-oxo-2-pyrazoline-4-carboxanilides and process therefor. 3,905,957, Cl. 260-239.00D.

Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH. Support mechanism for safety ski bindings. 3,905,611, Cl. 280-11.35T.

Sivers, Curt: *See—*
Soredal, Gunnar S.; and Sivers, Curt, 3,906,360.

Skidmore, Frank Oren, to Gottwald, Ann. Wheel balancing weight and combination thereof. 3,905,648, Cl. 301-5.00B.

Slovinsky, Manuel: *See—*
Matt, Joseph; and Slovinsky, Manuel, 3,906,105.

Smalarz, Anthony A.; and Yule, Roger T., to Kratos. Temperature compensated pressure gauge. 3,905,237, Cl. 73-393.000.

Smey, John L. Sleep preventing device. 3,906,478, Cl. 340-279.000.

Smilgys, Bruno S., to Veeder Industries, Inc. Resettable register mechanism. 3,906,206, Cl. 235-144.0ME.

Smith, Charles W.; and Dyer, Mahlon D., to GTE Sylvania Incorporated. Light measuring apparatus for apertured material. 3,906,239, Cl. 250-562.000.

Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Flame retardant urethane forms containing alkanol amino phosphonates. 3,905,922, Cl. 260-2.5AJ.

Smith, Dennis J.: *See—*
Greenleaf, Donald B.; and Smith, Dennis J., 3,905,134.

Smith, Ennis Dean, to Kain's Research and Development Company, Inc. Attachment for vehicle license plate holder. 3,905,637, Cl. 296-1.00C.

Smith, Fay D.: *See—*
Goza, Alva L.; Smith, Fay D.; Bentkowski, L. E.; Evans, Donald W.; Blake, Ronald P.; and Thompson, Jimmie L., 3,905,050.

Smith, George Elwood; and Vratny, Frederick, to Bell Telephone Laboratories, Incorporated. Solid state imaging apparatus employing charge transfer devices. 3,906,543, Cl. 357-24.000.

Smith, George Elwood: *See—*
Krambeck, Robert Harold; Smith, George Elwood; and Strain, Robert Joseph, 3,906,542.

Smith, Harry Tabb. Self-propelled recreational toy vehicle. 3,905,617, Cl. 280-206.000.

Smith, Ian W., to Alfred Herbert Limited. Positional servo system having three phase speed, numerical control. 3,906,324, Cl. 318-567.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,905,984.

Smith, Lawrence W., Jr.; and Roberts, Norman D., to United States of America, Army. Package penetration indicating apparatus. 3,905,233, Cl. 73-432.00R.

Smith, Leonard R.; and Kelly, Emmett J., to Midwest Machine Works, Inc. Tire mold cleaning apparatus. 3,905,155, Cl. 51-8.00R.

Smith, Matthew: *See—*
Nelmark, Jack D.; and Smith, Matthew, 3,905,168.

Smith, Melvin Dee: *See—*
Morris, David Alexander Nathaniel; and Smith, Melvin Dee, 3,905,767.

Smith, Michael Paul: *See—*
Scott, Hubert Dunkerley; and Smith, Michael Paul, 3,906,224.

Smith, Philip W.: *See—*
Pierce, Robert M.; Smith, Philip W.; and Kaminski, Walter R., 3,905,192.

Smith, Roger W. Table mounting for portable power saw. 3,905,263, Cl. 83-477.200.

Smith, Victor W.: *See—*
Taft, Donald L.; Smith, Victor W.; and Schumacher, Neal P., 3,905,202.
Smith, Warren K., to United States of America, Navy. Mechanical heat flux recorder. 3,905,228, Cl. 73-190.00H.
Smith, Woodrow Wilson; and Youngquist, David Jack, to Kuhlman Corporation. Methods of manufacturing dual interlocked safety spring assemblies. 3,905,403, Cl. 140-71.00R.
SmithKline Corporation: *See—*
Berges, David A., 3,905,967.
Snam Progetti S.p.A.: *See—*
Corbellini, Margherita; and Balducci, Agostino, 3,905,913.
Snape, George William, to Bulk Unit Load Systems Limited. Slide valve assemblies. 3,905,389, Cl. 137-375.000.
Snell, Brian Kenneth, to Imperial Chemical Industries Limited. Method and composition for combatting fungus with fungicidally-active pyrimidine derivatives. 3,906,094, Cl. 424-200.000.
Snipes, Eugene A. Fishing lure. 3,905,147, Cl. 43-17.100.
Sobin, Ben A.; Routien, John B.; Rao, Koppaka V.; Marsh, William S.; and Garretson, Aline L., to Pfizer Inc. Mithramycins and process therefor. 3,906,093, Cl. 424-119.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Vargiu, Silvio; Carpaneti, Edoardo; Passalenti, Beppino; and Paparatto, Pietro, 3,905,948.
S.A. des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard, 3,905,239.
Societe Anonyme dite: Hexachime: *See—*
Cognaco, Jean-Claude, 3,905,993.
Societe Anonyme dite: L'Oreal: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,905,761.
Vanlerberghe, Guy; and Sebag, Henri, 3,906,048.
Zviak, Charles; and Ghilardi, Giuliana, 3,906,091.
Societe Anonyme dite: Omnium de Prospective Industrielle S.A.: *See—*
Dalle, Jean-Paul, 3,905,763.
Societe Anonyme Francaise du Ferodo: *See—*
de Gennes, Gerard, 3,905,655.
Societe Anonyme: Poclain: *See—*
Bourges, Bernard M., 3,905,500.
Leroux, Jean E., 3,905,501.
Societe d'Applications Generales d'Electricite et de Mecanique: *See—*
Coupin, Claude; and Deval, Alain, 3,906,267.
Societe des Produits Chimigues de la Montagne Noire: *See—*
Trichot, Michel, 3,906,088.
Societe d'Etudes de Constructions et Travaux (SECTRA): *See—*
Paladian, Barbu Eugeniu, 3,905,579.
Societe d'Etudes de Machines Speciales: *See—*
Corse, Louis, 3,905,533.
Soda, Kazuya, to Nippondenso Co., Ltd. High-temperature temperature fuse device. 3,906,423, Cl. 337-158.000.
Soderberg, John W.: *See—*
Clearwaters, Walter L.; Kingsbury, Frederick J.; Shippey, Carlyle E., Jr.; and Soderberg, John W., 3,906,431.
Soderhamn Machine Manfacturing Company: *See—*
Gaitten, W. Maynard, 3,905,558.
Soga, Setsuo: *See—*
Kimura, Tsuguo; Soga, Setsuo; and Watanabe, Toshio, 3,905,331.
Solbern Corporation: *See—*
Eisenberg, Bernard, 3,905,326.
Sollami, Phillip A. Grinding machine for sharpening the cutting edges of a tool. 3,905,157, Cl. 51-92.0BS.
Somani, Pitambar; and Martin, Donald Lyons, to Abbott Laboratories. Aminoalkyl sulfate esters with diuretic activity. 3,906,107, Cl. 424-315.000.
Sonetaka, Kazunori: *See—*
Nishino, Atsushi; Sonetaka, Kazunori; Kumano, Hiroshi; and Noguchi, Yoshinori, 3,905,917.
Sony Corporation: *See—*
Esashika, Tadashi, 3,906,310.
Haibara, Kenichiro, 3,905,474.
Hongu, Masayuki; and Ikeda, Isamu, 3,906,386.
Iwase, Koichi; Saito, Takahiko; and Tanaka, Schosuke, 3,906,169.
Kawakami, Hirotake; Sasabe, Toshio; Hirosawa, Toshio; Sakai, Naomi; Arakawa, Nobuyuki; Kokubu, Kozo; Abe, Kazumasa; and Harashino, Toshiko, 3,905,448.
Okada, Takashi, 3,906,246.
Tanida, Kikuo; Teraoka, Kenro; and Inomata, Yuji, 3,906,251.
Yanagisawa, Yuzuru, 3,906,287.
Soredal, Gunnar S.; and Sivers, Curt, to LKB-Produkter AB. Method for electrical damping of mechanical disturbances in a magnetic field measuring system. 3,906,360, Cl. 324-43.00R.
SOS Consolidated, Inc.: *See—*
Feterl, Leon G., 3,905,644.
Sosinski, Charles W., to Thomas & Betts Corporation. Die set. 3,905,220, Cl. 72-475.000.
Souda, Kenji: *See—*
Kurimura, Yasuo; Furutani, Yoshio; Makiguchi, Nobuyoshi; and Souda, Kenji, 3,905,867.
Southern Machinery Company: *See—*
Emus, Ronald W., 3,905,860.
Sowards, Donald Maurice; and Watson, Richard N., to Du Pont de Nemours, E. I., and Company. Module. 3,905,775, Cl. 23-288.0FC.
Sparlin, Derry D.; and Kolb, Clarence B., Jr., to Continental Oil Company. Method of protecting well apparatus against contamination during handling. 3,905,423, Cl. 166-296.000.
Sparrevohn, Frederic R., to Communication Mfg. Co. Loop extender with bypass capacitor discharge. 3,906,162, Cl. 179-16.00F.
Sparrow, Donald B.: *See—*
Iannazzi, Fred D.; Rafferty, John W.; Sparrow, Donald B.; and Strauss, Richard, 3,906,064.
Sparton Corporation: *See—*
Shaw, Charles W., 3,906,490.
Speck, Stanley B., to Du Pont de Nemours, E. I., and Company. Orange phenylaznoazobenzene acid dye. 3,905,952, Cl. 260-186.000.
Speidel, Leslie Raymond. Boat lifting device. 3,905,499, Cl. 214-450.000.
Spencer, Harvey J.; and Wittkopf, Eugene W., to Kimberly-Clark Corporation. Folding apparatus. 3,905,592, Cl. 270-61.00R.
Sperry Rand Corporation: *See—*
Cappon, Arthur M., 3,906,461.
Chen, Evan N.; and Matthews, Hugh B., 3,906,263.
Govindarajan, Rangachari; Lobach, James L.; and Nichols, Kenneth E., 3,905,196.
Jones, John P.; and Stirling, Ronald C., 3,906,388.
Lo, David S.; and Paul, Maynard C., 3,906,466.
Morris, Richard H.; and Strenglein, Harry F., 3,906,362.
Petschauer, Richard J., 3,906,200.
Spier, Raymond E.: *See—*
McAleer, William J.; Spier, Raymond E.; and Posch, Kenneth L., 3,905,865.
Spiessens, Raymond Francois; and De Rop, Walter Jan Roza Adolf, to U.S. Philips Corporation. Electric lamp with electrolysis preventing apparatus. 3,906,275, Cl. 313-318.000.
Spisiak, Juraj: *See—*
Jansa, Milos; Bezdek, Miloslav; and Spisiak, Juraj, 3,905,402.
Spitz, David Allan, to Industrial Nucleonics Corporation. Non-linear feedback controller. 3,906,196, Cl. 235-150.100.
Spooner, Robert J., to Cashin System Corporation. Apparatus for stacking and weighing sliced food products. 3,905,259, Cl. 83-77.000.
Spra-Con Company, The: *See—*
Harrison, John, 3,905,469.
Harrison, John, 3,905,491.
Sprando, Anthony E. Electrical relay. 3,906,416, Cl. 335-128.000.
Sprecher & Schuh AG: *See—*
Glarner, Fritz, 3,906,180.
Spreckelmeyer, Bernhard W., to Kennecott Copper Corporation. Process for chlorinating copper sulfide minerals. 3,906,074, Cl. 423-40.000.
Squire, William D.: *See—*
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,906,434.
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,906,435.
Stachel, Hans-Joachim: *See—*
Feist, Wieland; and Stachel, Hans-Joachim, 3,905,707.
Stadler, Reinhard, to Futurinvest AG. Closure cap for infusion or transfusion flasks. 3,905,504, Cl. 215-316.000.
Stadnikoff, Wladimir: *See—*
Andre, Pierre; Duole, Claude; and Stadnikoff, Wladimir, 3,906,383.
Stambaugh, Terry L.: *See—*
Thomas, Douglas A.; and Stambaugh, Terry L., 3,905,735.
Stamlcarbon N.V.: *See—*
Dahlmans, Johannes J.; and Boesten, Wilhelmus H. J., 3,905,988.
Stanaback, Kenneth P. Tool-grinding guide and protector assembly. 3,905,159, Cl. 51-95.0LH.
Standard Oil Company, The: *See—*
Janes, John R., 3,905,306.
Wright, Robert M.; and Johncock, Allan W., 3,905,873.
Stanford Research Institute: *See—*
Crane, Hewitt David; and Savoie, Robert Ellis, 3,906,444.
Fishman, Norman; and Parkinson, Dean B., 3,906,055.
Henry, David W.; and Sturm, Priscilla A., 3,905,979.
Stanley Works, The: *See—*
Rutty, Edward C., 3,905,114.
Stansteel Corporation: *See—*
Preeman, Marvin B., 3,905,587.
Stanway, Edward, to United Merchants and Manufacturers, Inc. Method for fluid treatment of textile fabric in rope form. 3,905,059, Cl. 8-151.100.
Starev, Lyuben Rangelov: *See—*
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.
Stargell, Donald E.: *See—*
Dragomier, John D.; and Stargell, Donald E., 3,905,514.
Staschik, Gunter: *See—*
Winter, Karl; and Staschik, Gunter, 3,905,783.
Stauffer Chemical Company: *See—*
Weil, Edward D., 3,906,136.
Stauffer, Norman L., to Honeywell Inc. Focus detecting apparatus. 3,906,219, Cl. 250-204.000.
Steck, William F., III, to W. R. Weaver Company. Reflex sighting device. 3,905,708, Cl. 356-251.000.
Stedman, Robert N.; and Moser, Raymond L., to Caterpillar Tractor Co. Automated refuse collection vehicle. 3,905,497, Cl. 214-302.000.

Steel, Margaret Lilian: *See—*
Burling, Eric Douglas; and Steel, Margaret Lilian, 3,906,128.
Steinberg, Julius M.: *See—*
Cone, Charles N.; and Steinberg, Julius M., 3,905,329.
Cone, Charles N.; and Steinberg, Julius M., 3,905,921.
Steingruebner, Arthur. Method and apparatus for weaving a row of slide-fastener links into the edge of a tape. 3,905,401, Cl. 139-11.000.
Stem Development Corporation: *See—*
Markowitz, Isral J., 3,905,509.
Stent, Vernon Denis, to Creators Limited. Reinforced plastics tubes. 3,905,853, Cl. 156-187.000.
Stephen, John F. Hindered phenolic norbornane-2,3-dicarboximides. 3,906,002, Cl. 260-326.00C.
Stephens, Thomas C., to Rockwell International Corporation. Intensity comparing system for determining fraction of travel time or distance to a radiating source. 3,906,503, Cl. 343-112.00D.
Sterling Drug Inc.: *See—*
Alexander, Ernest John; and Mooradian, Aram, 3,905,998.
Stern, James F.: *See—*
Guy, Michael G.; and Powers, Richard G., 3,906,086.
Stern, Robert M.: *See—*
Guy, Michael G.; and Powers, Richard G., 3,906,086.
Sternbach, Leo Henryk: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 3,905,956.
Metlesics, Werner; and Sternbach, Leo Henryk, 3,905,994.
Steuler Industriewerke G.m.b.H.: *See—*
Kotting, Wolfgang, 3,905,774.
Stevenson, Donald W. Concrete pig pallet. 3,905,334, Cl. 119-20.000.
Stevenson, Robert H., to Megatherm Corporation. Computerized peak-shaving system for alleviating electric utility peak loads. 3,906,242, Cl. 307-38.000.
Stewart, John Kenneth, to Canron, Inc. Rail knocker. 3,905,300, Cl. 104-1.00R.
Stewart, Joseph Robert: *See—*
Schwartz, Alfred Alexander; and Stewart, Joseph Robert, 3,906,480.
Stickl, Helmut; and Hochstein-Mintzel, Volker. Inoculating tools for cutaneous vaccination using a dry vaccine. 3,905,371, Cl. 128-253.000.
Stiefvater, Clarence Kurt, to Illinois Tool Works Inc. Metallized capacitor with improved insulation between leads. 3,906,312, Cl. 317-260.000.
Stirland, Harry. Transmission assembly. 3,905,253, Cl. 74-803.000.
Stirling, Ronald C.: *See—*
Jones, John P.; and Stirling, Ronald C., 3,906,388.
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, to DSO "Metalurgia i Rudodobiv". Separation of solid metal impurities from zinc sulphate solutions. 3,905,802, Cl. 75-120.000.
Stokes, John H.; and Bondon, Raymond, to Elsan Limited. Toilets. 3,905,049, Cl. 4-10.000.
Stone Construction Equipment, Inc.: *See—*
Tertinek, Christian T.; and Stone, Guthrie B., 3,905,519.
Stone, Guthrie B.: *See—*
Tertinek, Christian T.; and Stone, Guthrie B., 3,905,519.
Stone, Rex D.: *See—*
Washschynsky, Bohdan; and Stone, Rex D., 3,905,296.
Stone, Robert Martin, to Combustion Engineering, Inc. Probe train including a flair detector and a radiation responsive recording means with alignment means having a natural curved cast. 3,906,358, Cl. 324-37.000.
Storck, Eckhard: *See—*
Ruell, Hartwig; and Storck, Eckhard, 3,905,674.
Strain, Robert Joseph: *See—*
Krambeck, Robert Harold; Smith, George Elwood; and Strain, Robert Joseph, 3,906,542.
Strantz, Lawrence D.: *See—*
Runyon, F. Sheldon; Strantz, Lawrence D.; Webb, Darryl S.; and Phenix, Charles E., 3,905,438.
Strauss, Richard: *See—*
Iannazzi, Fred D.; Rafferty, John W.; Sparrow, Donald B.; and Strauss, Richard, 3,906,064.
Strebel, David W. Pneumatic pump. 3,905,724, Cl. 417-128.000.
Strenglein, Harry F.: *See—*
Morris, Richard H.; and Strenglein, Harry F., 3,906,362.
Streppel, Herbert: *See—*
Bauer, Karl; and Streppel, Herbert, 3,905,185.
Stricker, Charles D.: *See—*
Bengel, Thomas G.; Sallo, Richard L.; and Stricker, Charles D., 3,905,885.
Strickland, Edward T. Method and apparatus for manufacturing glass fibers. 3,905,790, Cl. 65-2.000.
Strom, Richard Albert, to Control Data Corporation. Plasma panel erase apparatus. 3,906,451, Cl. 340-166.0EL.
Stromberg, Howard P., to Uarco Incorporated. Trimmer blade throw-off mechanism. 3,905,262, Cl. 83-425.200.
Struck, Robert T.: *See—*
Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., 3,906,080.
Stryker Corporation: *See—*
Richmond, James W., 3,905,662.
Stuart, Richard L.: *See—*
Querry, Lester R.; and Stuart, Richard L., 3,906,380.
Stubben GmbH, Riding Equipment: *See—*
Bischeltsrieder, Lorenz, 3,905,179.
Studley, Edward: *See—*
Haas, Thomas W.; Mach, Richard L.; Studley, Edward; and Hoffman, Robert, 3,906,072.
Sturm, Priscilla A.: *See—*
Henry, David W.; and Sturm, Priscilla A., 3,905,979.
Sturtz, Charles Robert, Jr.: *See—*
Guy, Douglas Stanley; McKenzie, Ian; and Sturtz, Charles Robert, Jr., 3,905,407.
Suarez-Gartner, Ricardo E., to University of California, The Regents of the. Reversible analog/digital (digital/analog) converter. 3,906,488, Cl. 340-347.00C.
Suggitt, Robert M.: *See—*
Knifton, John F.; and Suggitt, Robert M., 3,906,045.
Sugiyama, Hiroshi; Oride, Kazuyuki; and Morita, Masaaki, to Nissan Motor Co., Ltd. Automotive brake control system. 3,905,652, Cl. 303-21.0EB.
Suh, John T.: *See—*
Schnettler, Richard A.; and Suh, John T., 3,905,980.
Sullivan, James F., to Honeywell Information Systems, Inc. Overcurrent sensor. 3,906,309, Cl. 317-18.00R.
Sulyok, Pal: *See—*
Nagy, Istvan; Sulyok, Pal; Vas, Ivan; and Viragh, Istvan, 3,905,258.
Sulzer-Ksb Kernkraftwerkspumpen GmbH: *See—*
Hubner, Werner, 3,905,605.
Sumita, Toru: *See—*
Kobori, Toshio; and Sumita, Toru, 3,906,518.
Sumitomo Chemical Company Limited: *See—*
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, 3,906,003.
Nagase, Tsuneyuki; Suzukamo, Gohu; Yoneyshi, Yukio; and Yoshioka, Hirosuke, 3,906,026.
Okamoto, Yasushi; and Morimoto, Masayoshi, 3,906,056.
Okuno, Yoshitoshi; Toyoura, Akira; and Higo, Akio, 3,906,089.
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.
Sumitomo Electric Industries, Ltd.: *See—*
Kurauchi, Noritaka; Yoshida, Kenichi; Kobayashi, Yoshinobu; and Kuroda, Masataka, 3,906,436.
Sun Oil Company (Delaware): *See—*
Bradley, William S.; Hardy, William C.; and Lea, James F., Jr., 3,905,553.
Sun Oil Company of Pennsylvania: *See—*
Shawhan, Elbert N., 3,906,471.
Sunbeam Corporation: *See—*
Churas, Algerd C.; and Hemrich, William R., 3,905,379.
Sunbury, Robert: *See—*
Brossi, Arnold; Pecherer, Benjamin; and Sunbury, Robert, 3,906,006.
Sunds Aktiebolag: *See—*
Petterson, Bengt Edvard, 3,905,766.
Super Laundry Machinery Company, Inc.: *See—*
Behn, Sheldon P., 3,905,593.
Surmatis, Joseph Donald; and Walser, Armin, to Hoffmann-La Roche Inc. 8-(2,6,6-Trimethyl-4-oxo-2-cyclohexen-1-ylidene-2-methylene-6-methyl-4,6-octadien-3-ol. 3,906,047, Cl. 260-586.00R.
Susaki, Wataru: *See—*
Mitsui, Kotaro; Ishizu, Akira; and Susaki, Wataru, 3,905,704.
Sussman, Ernst. Collet seal. 3,905,609, Cl. 279-20.000.
Suter, Leslie D. Second deck system. 3,905,309, Cl. 105-372.000.
Sutton, Harold E.: *See—*
Hibl, Joseph J.; and Sutton, Harold E., 3,905,508.
Suzukamo, Gohu: *See—*
Nagase, Tsuneyuki; Suzukamo, Gohu; Yoneyshi, Yukio; and Yoshioka, Hirosuke, 3,906,026.
Suzuki, Todao; and Maruyama, Hiroshi, to Maruhachi Kasei Kogyo Kabushiki Kaisha. Apparatus for preparing a synthetic floating pipe. 3,905,749, Cl. 425-113.000.
Suzuki, Yasoji; and Ogawa, Hisaharu, to Tokyo Shibaura Electric Co., Ltd. Drive pulse generator for use in electronic analog display clock apparatus. 3,906,256, Cl. 307-225.00R.
Svechnikov, Erik Nikolaevich: *See—*
Vlasov, Pavel Semenovich; Ivanov, Alexandr Karlovich; Svechnikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich, 3,905,546.
Svensson, Per-Olov: *See—*
Kjellberg, Leif Roland; Riise, Kjell; and Svensson, Per-Olov, 3,906,318.
Swanson, Kenneth H. Dental articulator. 3,905,112, Cl. 32-32.000.
Swapceinski, John P.: *See—*
Rubin, Jacob C.; and Swapceinski, John P., 3,906,475.
Swaters, Pieter Dirk: *See—*
Havinga, Reginoldus; and Swaters, Pieter Dirk, 3,906,029.
Swedberg, Nils Einar, to Eaton Corporation. Rotary fluid pressure device and pressure relief system therefor. 3,905,728, Cl. 418-61.00B.
SWF Machinery, Inc.: *See—*
Paxton, Gerald C., 3,905,541.
Swick, Edwin Grant: *See—*
Andersen, Stephen Verner; and Swick, Edwin Grant, 3,905,318.
SWS Silicones Corporation: *See—*
Piskoti, Charles, 3,905,823.

Sybron Corporation: *See—*
Ensslin, Frieder H.; and Yarnall, Paul J., 3,906,227.
Sylvan, Tage Peter, to Teradyne, Inc. Protective apparatus for digital logic circuits. 3,906,298, Cl. 317-33.0SC.
Sylvester, Merton E. Hitch device. 3,905,619, Cl. 280-415.00A.
Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 3,906,038.
Syva Company: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 3,905,871.
Szabo, Francis S., to Addressograph Multigraph Corporation. Method of and apparatus for multi-galley composition. 3,905,699, Cl. 355-41.000.
Szolis, Walter J. Electric heated applicator tool. 3,906,186, Cl. 219-242.000.
Szomanski, Zbigniew Janusz, to Zem of Wales Limited. Securing devices for use in jewellery. 3,905,069, Cl. 24-73.0HR.
Tabb, Lester M. Bicycle roller system. 3,905,597, Cl. 272-73.000.
Tabuse, Akira: *See—*
Oba, Seiichiro; Tabuse, Akira; and Yasumoto, Koji, 3,906,059.
Tachibana, Kan-Ichi; Nishioka, Michihiro; and Ono, Mikiya, to Mitsubishi Mining & Cement Company, Ltd. Oxide semiconductor-metal contact resistance elements. 3,906,425, Cl. 338-20.000.
Tadokoro, Eiichi; and Aonuma, Masashi, to Fuji Photo Film Co., Ltd. Magnetic recording body. 3,905,779, Cl. 29-194.000.
Taft, Donald L.; Smith, Victor W.; and Schumacher, Neal P., to Emhart Corporation. Refrigeration system. 3,905,202, Cl. 62-152.000.
Tagaya, Ryosaku: *See—*
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, 3,906,378.
Taguchi, Nobuo: *See—*
Ono, Takehiko; and Taguchi, Nobuo, 3,906,323.
Takahama, Sho; and Hamada, Yoichi, to Fuji Photo Film Co., Ltd. Camera with interchangeable parts. 3,906,535, Cl. 354-288.000.
Takahashi, Akira, to Ricoh Co., Ltd. Device for controlling lighting time of lamp. 3,906,292, Cl. 315-208.000.
Takahashi, Kiyoshi: *See—*
Moriyama, Inao; Itani, Takashi; and Takahashi, Kiyoshi, 3,905,693.
Takahashi, Naoki; Taneda, Yukinori; and Kobayashi, Takashi, to Hitachi, Ltd. Caulking apparatus. 3,905,862, Cl. 156-580.000.
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, to Eisai Co., Ltd. Electronic circuit for eliminating coincidental signal from hybrid signals. 3,906,378, Cl. 328-110.000.
Takai, Satoshi; Izutsu, Seiji; Iida, Shigenobu; and Terao, Osamu, to Howa Kogyo Kabushiki Kaisha. Apparatus for simultaneously doffing and donning apparatus. 3,905,184, Cl. 57-52.000.
Takeda, Matsuyuki: *See—*
Harada, Masahiro; Takeda, Matsuyuki; Ichida, Mamoru; Nozaki, Shohei; and Miyahara, Kenji, 3,905,834.
Takeda, Nobuhiro; Yanagi, Osamu; Mizuno, Shigeo; and Hayashi, Toyoshi, to Kabushiki Kaisha Tokai R³ka Denki Seisakusho. Device for indicating a direction on the earth's surface. 3,905,121, Cl. 33-361.000.
Takeda Riken Kogyo Kabushikikaisha: *See—*
Maejima, Tsugie, 3,906,195.
Takekoshi, Tohru; and Kochanowski, John E., to General Electric Company. Method for making polyetherimides and products produced thereby. 3,905,942, Cl. 260-47.0CP.
Takemura, Takehide: *See—*
Minami, Shunji; Takemura, Takehide; and Oka, Shunzo, 3,906,366.
Takeuchi, Nobuo: *See—*
Togo, Masaaki; and Takeuchi, Nobuo, 3,905,229.
Takimoto, Yasuyuki: *See—*
Sakurai, Kiyomi; Fukushima, Yutaka; and Takimoto, Yasuyuki, 3,905,819.
Tamaki, Kiheiji; Miura, Yoshiaki; Okamoto, Akira; and Nakamura, Masaaki, to Nippon Steel Corporation. Method for desulfurizing a waste gas. 3,906,079, Cl. 423-242.000.
Tamburino, James C.; and Zaborsky, George, to International Harvester Company. Splash guard arrangement. 3,905,616, Cl. 280-154.50R.
Tamura, Katunori: *See—*
Yatagai, Shukuro; and Tamura, Katunori, 3,905,494.
Tanaka, Keiichi, to Agency of Industrial Science & Technology. Apparatus for regulating distance between reflection mirrors of laser resonator. 3,906,394, Cl. 331-94.50C.
Tanaka, Schosuke: *See—*
Iwase, Koichi; Saito, Takahiko; and Tanaka, Schosuke, 3,906,169.
Tanaka, Tutomu: *See—*
Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, 3,905,866.
Tanaka, Yoshiharu: *See—*
Yoshikawa, Motohiko; Shimizu, Yoshiaki; Tanaka, Yoshiharu; and Ishii, Kazuo, 3,905,964.
Tanase, Tosio: *See—*
Kuwako, Tomohisa; and Tanase, Tosio, 3,906,264.
Taneda, Yukinori: *See—*
Takahashi, Naoki; Taneda, Yukinori; and Kobayashi, Takashi, 3,905,862.
Tanida, Kikuo; Teraoka, Kenro; and Inomata, Yuji, to Sony Corporation. Plurality of selective sources for converter system. 3,906,251, Cl. 307-45.000.
Tanishima, Yasuo: *See—*
Miyamoto, Bunichi; Tanishima, Yasuo; and Shimizu, Takafumi, 3,906,382.
Tanji, Mikiharu, to Ise Electronics Corporation. Inert intermediate adhesive layer for a fluorescent substance in a fluorescent electronic tube. 3,906,269, Cl. 313-496.000.
Tano, Takeo: *See—*
Fujioka, Koichiro; and Tano, Takeo, 3,905,811.
Tanoshima, Katsuhide: *See—*
Watanabe, Akinori; and Tanoshima, Katsuhide, 3,906,355.
Tappan Company, The: *See—*
Carpenter, Charlie P., 3,905,789.
Tate, Donald P.: *See—*
Desmonds, Daniel J.; Tate, Donald P.; and Robbins, Douglas A., 3,906,459.
Tatsuno, Hiyoshi. Pistol type nozzle valve. 3,905,524, Cl. 222-536.000.
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, to Givaudan Corporation. Cyclic acetal perfume composition. 3,905,919, Cl. 252-522.000.
Tawara, Junro; and Ohhashi, Masanori, to Dai Nippon Printing Co., Ltd. Method of fabricating coils. 3,905,096, Cl. 29-605.000.
Taylor, David W.: *See—*
Long, Kenneth E.; and Taylor, David W., 3,905,776.
Taylor Industries, Inc.: *See—*
Taylor, Philip W., 3,906,146.
Taylor, John W., Jr., to Westinghouse Electric Corporation. Radar interface method and system. 3,906,498, Cl. 343-17.1PF.
Taylor, Philip W., to Taylor Industries, Inc. Modular wiring duct and wire holder system. 3,906,146, Cl. 174-72.00A.
Taylor, Robert A.; and Brandao, Ruy L., to Bendix Corporation, The. Means for synchronizing an antenna with a digital data display. 3,906,494, Cl. 343-5.0DP.
Taylor, Stanford E. Controlled reading device. 3,905,695, Cl. 353-111.000.
Tecator Instrument AB: *See—*
Mossberg, Leif Roger, 3,905,770.
Teche, Andre: *See—*
Perronnet, Jacques; and Teche, Andre, 3,905,996.
Techmet Company: *See—*
Petrohilos, Harry G., 3,905,705.
Techni-Plaste S.A.: *See—*
Gallay, Francis J., 3,905,505.
Technicon Instruments Corporation: *See—*
Watts, Leonard, 3,905,418.
Techno Corporation: *See—*
Pysh, Wasyl A., 3,905,390.
Tektronix, Inc.: *See—*
Addis, John Lindsey; and Peltola, Ronald Wayne, 3,906,344.
Teldix GmbH: *See—*
Muller, Paul; and Leiber, Heinz, 3,905,653.
Teledyne, Inc.: *See—*
Hollmann, Walter G.; and Newlin, Harry O., 3,906,127.
Teledyne Mid-America Corporation: *See—*
Wenrich, Carl M.; and Hoverter, Bryce E., Jr., 3,906,328.
Telefonaktiebolaget L M Ericsson: *See—*
Brunberg, Karl Gunnar, 3,905,590.
Telefonaktiebolaget LM Ericsson: *See—*
Kjellberg, Leif Roland; Riise, Kjell; and Svensson, Per-Olov, 3,906,318.
Telefunken Patentverwertungsgesellschaft m.b.H.: *See—*
Epple, Richard, 3,905,836.
Rehbock, Ekkehard, 3,905,298.
Tenneco Chemicals, Inc.: *See—*
Dowthwaite, Edwin; and Hiskens, Ian Richard, 3,906,142.
Tenner, Oskar, to Gravicast Patentverwertungsge-Gesellschaft mbH. Device for rise casting into a mold. 3,905,419, Cl. 164-337.000.
Teradyne, Inc.: *See—*
Sylvan, Tage Peter, 3,906,298.
Terao, Osamu: *See—*
Takai, Satoshi; Izutsu, Seiji; Iida, Shigenobu; and Terao, Osamu, 3,905,184.
Teraoka, Kenro: *See—*
Tanida, Kikuo; Teraoka, Kenro; and Inomata, Yuji, 3,906,251.
Terris, Barbara Zitko: *See—*
Harris, Louis Selig; Pars, Harry George; Razdan, Raj Kumar; and Terris, Barbara Zitko, 3,905,969.
Tertinek, Christian T.; and Stone, Guthrie B., to Stone Construction Equipment, Inc. Mixer drum with automatic latching and knee-lift unlatching assembly. 3,905,519, Cl. 222-166.000.
Terzic, Bojan: *See—*
Anderson, Robert Frederick; and Terzic, Bojan, 3,905,927.
Tessmer, Wallace David. Service pedestal for electrical control means including a meter. 3,906,295, Cl. 317-107.000.
Tetlak, Joseph F., to Willow Hill Industries, Inc. Method of constructing axle housing assembly. 3,905,086, Cl. 29-428.000.
Texaco Inc.: *See—*
Dorn, Peter, 3,905,781.
Haugen, Haakon, 3,905,908.
Knifton, John F.; and Suggitt, Robert M., 3,906,045.
Scott, Hubert Dunkerley; and Smith, Michael Paul, 3,906,224.
Woodward, Charles D., 3,905,422.
Texas Instruments, Incorporated: *See—*
Vieira, Joseph G.; and Plouffe, Leo A., 3,906,248.
Textron, Inc.: *See—*
Barr, Charles; and Urquhart, George B., 3,905,297.
Brandwein, Rowland; and Gupta, Mohan, 3,906,437.
Hanusa, Helmut G., 3,906,068.
Theis, Leon J.: *See—*
Busse, Floyd E.; and Theis, Leon J., 3,905,284.

Therm-O-Disc Incorporated: *See—*
Clancy, Raymond W.; and Huffman, John W., 3,906,424.
Thiem, Karl-Werner: *See—*
Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 3,906,011.
Thilenius, Arnulf: *See—*
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.
Thomas, Benjamin A.: *See—*
Olsen, John H.; and Thomas, Benjamin A., 3,905,608.
Thomas & Betts Corporation: *See—*
Sosinski, Charles W., 3,905,220.
Wittes, James M., 3,906,148.
Thomas, Douglas A.; and Stambaugh, Terry L., to General Motors Corporation. Stack molding apparatus. 3,905,735, Cl. 425-256.000.
Thompson, Jimmie L.: *See—*
Goza, Alva L.; Smith, Fay D.; Bentkowski, L. E.; Evans, Donald W.; Blake, Ronald P.; and Thompson, Jimmie L., 3,905,050.
Thompson, John Michael. Apparatus for use in analysing fluids. 3,906,241, Cl. 250-574.000.
Thomson-CSF: *See—*
Brasier, Jean, 3,906,497.
Lamoureux, Andre, 3,906,306.
Meriaux, Claude; and Aime, Jacques, 3,906,213.
Narbaits-Jaureguy, Jean-Raymond; and Billottet, Henri, 3,906,492.
Roger, Joseph, 3,906,495.
Thornburg, David D.; and Johnson, Richard I., to Xerox Corporation. Solid state element comprising semi-conductive glass composition exhibiting negative incremental resistance and threshold switching. 3,906,537, Cl. 357-2.000.
Thumm, Helmut; and Kettel, Hans, to Willy Sauter KG. Tool rotating device. 3,905,257, Cl. 82-36.00A.
Thurk, Joachim: *See—*
Hashoff, Lothar; Luxa, Gunther; Thurk, Joachim; and Diessner, Armin, 3,906,149.
Thyroid Diagnostics, Inc.: *See—*
Mead, Louis W.; and Deutsch, Marshall E., 3,905,521.
Tiemann, Jerome J.: *See—*
Engeler, William E.; and Tiemann, Jerome J., 3,906,544.
Timms, Peter Leslie: *See—*
Middleton, Robert; Timms, Peter Leslie; and Gibson, Geoffrey Moorhouse, 3,906,017.
Tindall, David L. Board game apparatus. 3,905,601, Cl. 273-131.0AB.
Tipe Revent AB: *See—*
Johansson, Leif A. T.; and Pers, Nils G., 3,905,760.
Tipton, William G., to Cavalier Packaging Company, Inc. Collapsible solution tray. 3,905,544, Cl. 229-41.00B.
Tjurin, Nikolai Kuzmich: *See—*
Vlasov, Pavel Semenovich; Ivanov, Alexandr Karloyich; Svechnikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich, 3,905,546.
Togo, Masaaki; and Takeuchi, Nobuo, to Honeywell Inc. Temperature compensating system. 3,905,229, Cl. 73-194.00E.
Tokuyama Soda Kabushiki Kaisha: *See—*
Oba, Seiichiro; Tabuse, Akira; and Yasumoto, Koji, 3,906,059.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Iijima, Taizo; and Mori, Kenichi, 3,906,446.
Ono, Takehiko; and Taguchi, Nobuo, 3,906,323.
Suzuki, Yasoji; and Ogawa, Hisaharu, 3,906,256.
Tomatsuri, Masakazu, to Nippon Kogaku K.K. Camera protector member for use with a suspension ring for camera. 3,905,526, Cl. 224-5.00V.
Tomcuecik, Andrew Stephen; Izzo, Patrick Thomas; and Fabio, Paul Frank, to American Cyanamid Company. 6-Substituted oxo and thio-3-nitroimidazo(1,2-b)-pyridazines and methods of preparing same. 3,905,974, Cl. 260-250.0AC.
Tomita, Tamaki; and Kodama, Hayashi, to Toyoda Koki Kabushiki Kaisha. Grinding machine with feed rate changing apparatus. 3,905,161, Cl. 51-165.770.
Tomlin, Clive Dudley Spencer: *See—*
Barlow, Charles Brian; White, Brian Graham; and Tomlin, Clive Dudley Spencer, 3,906,098.
Torii, Tatsumi; and Miyajima, Haruo, to Alsin Seiki Co., Ltd. Brake assembly. 3,905,456, Cl. 188-79.50P.
Torpey, Wilbur N., to Autotrol Corporation. Method of wastewater treatment. 3,905,899, Cl. 210-14.000.
Torti, Maurice L., Jr., to Norton Company. Composite ceramic turbine rotor. 3,905,723, Cl. 416-241.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ashizawa, Yoshimi, 3,905,158.
Manabe, Takao; and Kumamoto, Satosi, 3,906,356.
Tottori, Hiroshi: *See—*
Kurahashi, Koichiro; and Tottori, Hiroshi, 3,906,290.
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, to Sumitomo Chemical Company, Limited. Certain 3,5-Dichlorophenyl compound as an antifungal agent. 3,906,102, Cl. 424-274.000.
Toukan, Sameeh Said: *See—*
Hager, Robert Bonner; and Toukan, Sameeh Said, 3,906,049.
Toussaint, Francois: *See—*
Plumat, Emile; Schottey, Jean; and Toussaint, Francois, 3,905,791.
Townsend, John K.; and Sanford, Chester E., to Vistron Corporation. Apparatus for preparing striped sheet material continuously. 3,905,858, Cl. 156-436.000.
Toyama, Philip M. Acupuncture needle. 3,905,375, Cl. 128-329.00A.
Toyo Kogyo Co., Ltd.: *See—*
Mino, Hiroshi; Sasatani, Tadashi; and Kobayashi, Tadaki, 3,905,217.
Shimoji, Masaharu; and Satou, Haruhiko, 3,905,337.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Nakazawa, Hideaki; Iikuni, Tetsuo; and Akashi, Mitsumasa, 3,905,932.
Toyoda, Kenichi: *See—*
Shichida, Hiromichi; Toyoda, Kenichi; and Irie, Seiji, 3,906,262.
Toyoda Koki Kabushiki Kaisha: *See—*
Tomita, Tamaki; and Kodama, Hayashi, 3,905,161.
Toyoshima, Sakae; and Sawada, Yasunori, to West Electric Company, Ltd. Flash and camera device. 3,906,526, Cl. 354-149.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakada, Masahiko; and Matsumoto, Hirofumi, 3,905,345.
Toyoura, Akira: *See—*
Okuno, Yoshitoshi; Toyoura, Akira; and Higo, Akio, 3,906,089.
Tran, Duc Tien, to C.G.R.-Mev. Multiperiodic accelerator structures for linear particle accelerators. 3,906,300, Cl. 315-5.420.
Transcinor, Inc.: *See—*
Caylor, Henry J.; and Ives, Marion P., 3,905,632.
Trap, Hendrikus Johan Lodewijk, to U.S. Philips Corporation. Method of manufacturing semi-conducting glasses exhibiting electrical conductivity in the mass. 3,905,792, Cl. 65-18.000.
Trattner, Hermann; and Raab, Hans, to Siemens Aktiengesellschaft. Metering system for metering fluxes. 3,905,328, Cl. 118-74.000.
Tremblay, Maurice H.: *See—*
Brown, Perry H.; and Tremblay, Maurice H., 3,905,831.
Treutler, Christian: *See—*
Schneider, Ernst; Simon, Manfred; Weiss, Richard; Hover, Alexander; and Treutler, Christian, 3,906,065.
Tribe, Leonard T., to Kelsey-Hayes Company. Skid control system for dual brake. 3,905,654, Cl. 303-21.00F.
Tribellini, Aldo, to Creusot-Loire. Process for removing hydrocarbons and other organic products from aqueous fluids. 3,905,901, Cl. 210-21.000.
Trichot, Michel, to Societe des Produits Chimigues de la Montagne Noire. Pharmaceutical tablets coated with vinyl terpolymers. 3,906,088, Cl. 424-33.000.
Trifunovic, Alexander L.; and Hills, William H., to Joseph Bancroft & Sons Co. Yarn winding mechanism. 3,905,560, Cl. 242-18.0DD.
Trip Inspectors, Inc.: *See—*
Clary, Derwin R., 3,905,115.
Trocciola, John C., to United Aircraft Corporation. Novel fuel cell structure. 3,905,832, Cl. 136-86.00R.
Tropel, Inc.: *See—*
Kleiber, Joseph P., 3,905,163.
Trozzolo, Anthony Marion: *See—*
Dienes, Andrew; Shank, Charles Vernon; and Trozzolo, Anthony Marion, 3,906,399.
TRW Inc.: *See—*
Beetle, Arthur B., 3,905,097.
Claxton, Dale H., 3,906,385.
Gerken, John M., 3,905,173.
Hunt, Delbert E., 3,906,297.
Jones, Robert J., 3,905,941.
Tsubokawa, Masakatsu: *See—*
Maeda, Kazuo; and Tsubokawa, Masakatsu, 3,905,492.
Tsuji, Tom T., to J.I.L. Corporation of America, Inc. Replacement radio receiver apparatus for automotive installations including adjustably positionable control elements and chassis case. 3,906,371, Cl. 325-352.000.
Tsukashima, Keiichi: *See—*
Enoki, Kichiji; Yao, Toshio; Ishimitsu, Keiichi; Tsukashima, Keiichi; and Ikari, Eiichi, 3,905,995.
Tsurumi, Takashi; Emori, Shuichi; Daigoh, Kiyokazu; Ikegami, Takemi; and Kaneko, Tutomu, to Asahi Kasei Kogyo Kabushiki Kaisha. Non-woven and perforated textile fabrics made from continuous synthetic fiber, and a process for the manufacture of same. 3,906,130, Cl. 428-131.000.
Tucker, Richard B. C.; and Crawford, William C., to Wm. T. Burnett & Co., Incorporated. Method of attaching mesh webbing to a lacrosse stick. 3,905,088, Cl. 29-433.000.
Tuhro, Richard H., to Computer Identics Corporation. Threshold error compensator for pulse width measurement circuit. 3,906,379, Cl. 328-112.000.
Tuke, Michael Anthony, to National Research Development Corporation. Saws and blades therefor. 3,905,105, Cl. 30-393.000.
Turner, Raymond R.: *See—*
Naone, Phillip L.; and Turner, Raymond R., 3,905,148.
Turner Research, Inc.: *See—*
Turner, William F., 3,905,338.
Turner, Warren E.: *See—*
Dreibelbis, Richard C.; Homeyer, Arthur C.; and Turner, Warren E., 3,905,518.
Turner, William F., to Turner Research, Inc. Vee engine with centrifugally assisted scavenging. 3,905,338, Cl. 123-43.00A.
Turoczi, Alexander, Jr. Infrared pressing iron with detachable throwaway sole plate and optional ultraviolet source. 3,906,187, Cl. 219-254.000.

Twigger, James Raymond: *See—*
Carini, George Francis; Hommel, Ernest Mayer; and Twigger, James Raymond, 3,906,124.
Tyler, Walter S.: *See—*
Hoegberg, Ruth G.; and Tyler, Walter S., 3,905,902.
Tytell, Alfred A.: *See—*
Hilleman, Maurice R.; Tytell, Alfred A.; and Woodhour, Allen F., 3,906,092.
Uarco Incorporated: *See—*
Juszak, Joseph J.; and Absler, Howard K., 3,905,545.
Stromberg, Howard P., 3,905,262.
Ueda, Hiroshi; and Yoshizaki, Akira, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera light measuring system. 3,906,519, Cl. 354-59.000.
Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Self-processing camera. 3,906,521, Cl. 354-86.000.
Ueda, Hiroshi: *See—*
Kuramoto, Yoshio; Kobori, Toshio; and Ueda, Hiroshi, 3,906,532.
Ueda, Minoru: *See—*
Tottori, Nobumasa; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,906,102.
Ueeda, Ryuhei, to Kuraray Co., Ltd. Method for producing maleic anhydride. 3,906,008, Cl. 260-346.80A.
Uher, Joseph F., to SCM Corporation. Process of treating sheet steel. 3,906,125, Cl. 427-330.000.
Uhl, Wyman F., to Litton Business Systems, Inc. Prefinished overlay paper. 3,906,132, Cl. 428-152.000.
Uhrig, Charles L., to Schroer Manufacturing Company. Cage for laboratory animals. 3,905,333, Cl. 119-17.000.
Ullman, Edwin F.: *See—*
Rubenstein, Kenneth E.; and Ullman, Edwin F., 3,905,871.
Ulrich, Henri: *See—*
Smith, Curtis P.; and Ulrich, Henri, 3,905,922.
Ulrich, Manfred: *See—*
Andelfinger, Claus; Dommaschk, Walter; Ott, Werner; Ulrich, Manfred; and Weber, German, 3,906,280.
Ulrich, Reinhard, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Coupling device for optical waveguide. 3,905,676, Cl. 350-96.00C.
Unger, William L.: *See—*
Evans, Robert F.; and Unger, William L., 3,905,673.
Union Carbide Corporation: *See—*
Chiu, Herman S., 3,905,397.
Coveney, Joseph F.; and La Clair, Louis M., 3,905,201.
Davis, Charles, Jr., 3,905,851.
Graham, John Robert, 3,905,477.
Louzos, Demetrios V., 3,905,830.
Louzos, Demetrios V., 3,905,833.
Meyerhoff, Robert W., 3,906,412.
Ostrozynski, Robert Leopold, 3,906,018.
Prokai, Bela, 3,905,924.
Union Corporation: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,906,087.
Uniroyal Limited: *See—*
Dunnet, George, 3,905,399.
United Aircraft Corporation: *See—*
Kalmanash, Michael H., 3,906,333.
Pierce, Robert M.; Smith, Philip W.; and Kaminski, Walter R., 3,905,192.
Trocciola, John C., 3,905,832.
United Hydraulics Corporation: *See—*
Yadon, Donald E., 3,905,279.
United Merchants and Manufacturers, Inc.: *See—*
Stanway, Edward, 3,905,059.
United States of America
Air Force: *See—*
Hess, Richard F., 3,906,214.
Nessler, Norbert; and Fritz, Dieter, 3,906,361.
Van Etten, Paul, 3,906,252.
Army: *See—*
Czerwinski, Watson P., 3,906,403.
Dixon, Samuel, Jr., 3,906,404.
Johnson, Bobby Dean, 3,905,272.
Nicholas, John F.; and Salvagni, Edward A., 3,906,259.
Redman, Charles M., 3,906,499.
Redman, Charles M., 3,906,500.
Smith, Lawrence W., Jr.; and Roberts, Norman D., 3,905,233.
Commerce: *See—*
Okabe, Hideo; and Schwarz, Frederick P., 3,906,226.
Energy Research and Development Administration: *See—*
Goldfuss, George T., 3,905,243.
Johnson, Melvin L.; and Shawver, Bruce M., 3,905,634.
Health, Education and Welfare: *See—*
Carroll, Robert G., 3,906,522.
National Aeronautics and Space Administration; administration; with respect to an invention of:
Elachi, Charles. Acoustically controlled distributed feedback laser. 3,906,393, Cl. 331-94.50C.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Engel, Alexander. Symmetrical odd-modulus frequency divider. 3,906,374, Cl. 328-41.000.
Irwin, Arthur S. Drilled ball bearing with a one piece anti tipping cage assembly. 3,905,660, Cl. 308-191.000.
Russell, Gary R.; Nerheim, Noble M.; and Pivirotto, Thomas J. Inert gas metallic vapor laser. 3,906,398, Cl. 331-94.50G.
Saffren, Melvin M. Doped Josephson tunneling junction for use in a sensitive IR detector. 3,906,231, Cl. 250-338.000.
Silver, Robert H.; Lewis, Gilbert W.; Feldstein, Cyril; and Duran, Edward N. Subminiature insertable force transducer. 3,905,356, Cl. 128-2.00S.
National Aeronautics and Space Administration: *See—*
Maserjian, Joseph; and Lewicki, George W., 3,906,296.
McKenzie, Robert L., 3,906,397.
Navy: *See—*
Adrian, Donald J.; and Cash, Carlton H., 3,906,493.
Berta, Dominic A., 3,905,846.
Clearwaters, Walter L.; Kingsbury, Frederick J.; Shippey, Carlyle E., Jr.; and Soderberg, John W., 3,906,431.
Dyer, Frederick N., 3,905,132.
Goodrich, Hunter Crary, 3,906,496.
Harris, Robert W., 3,906,377.
Hunter, John M., 3,906,346.
Mueller, William J., 3,905,320.
Pearl, Lowell Raymond; and Mesecar, Roderick S., 3,905,706.
Redifer, James L., 3,906,456.
Schulman, Marvin, 3,905,615.
Shaw, Herbert J., 3,905,235.
Smith, Warren K., 3,905,228.
Whitehouse, Harper John, 3,906,409.
U.S. Philips Corporation: *See—*
de Niet, Edmond, 3,906,154.
Duistermaat, Jan Hendrik; and Panis, Constantius Johannes Waltherus, 3,906,288.
Gerritsen, Jan, 3,906,303.
Hoogendijk, Adrianus Huibert, 3,906,152.
Linssen, Henricus Wilhelmus Maria, 3,906,279.
Martel, Hubert; and Paris, Pierre, 3,906,387.
Nillesen, Antonius Hendrikus Hubertus Jozef, 3,906,305.
Pittaway, Lawrence Graham, 3,906,237.
Sauermann, Heinz; and Winkler, Gerhard, 3,906,539.
Schayes, Raymond Georges; Gustin, Pol Ambroise Ghislain Joseph; and Schmitz, Jean Fernand Raymond, 3,906,291.
Spiessens, Raymond Francois; and De Rop, Walter Jan Roza Adolf, 3,906,275.
Trap, Hendrikus Johan Lodewijk, 3,905,792.
Van Hattum, Johannes Simon Albert, 3,906,307.
van Straaten, Jan, 3,906,155.
Wijsboom, Dan Bernardus, 3,906,302.
United States Pipe and Foundry Company: *See—*
Malizio, Andrew B.; Rice, Martin A.; and Brooks, Harry F., 3,905,809.
United States Steel Corporation: *See—*
Bengel, Thomas G.; Sallo, Richard L.; and Stricker, Charles D., 3,905,885.
Schowalter, Kenneth A.; and Hunter, Richard H., 3,905,805.
United States Surgical Corporation: *See—*
Noiles, Douglas G.; and Bryan, Graham W., 3,905,276.
United Technologies Corporation: *See—*
Parenti, Edmund K., Jr.; Bloomfield, David P.; Grevstad, Paul E.; and Beal, Daniel W., 3,905,884.
Universal Oil Products Company: *See—*
Horsfield, David, 3,905,058.
University of California, The Regents of the: *See—*
Suarez-Gartner, Ricardo E., 3,906,488.
University of Miami: *See—*
Gordon, Michael S.; Colenbrander, August; and Patterson, Darrell G., 3,905,130.
Uphoff, Billie J., to Morton Buildings, Inc. Scaffold on roll-over frame on a vehicle. 3,905,449, Cl. 182-82.000.
Upjohn Company, The: *See—*
Smith, Curtis P.; and Ulrich, Henri, 3,905,922.
Urano, Fumio: *See—*
Ishii, Haruo; Urano, Fumio; Kawasaki, Masahiro; and Mochizuki, Toshio, 3,906,531.
Nomura, Katsuhiko; Urano, Fumio; and Kurei, Hiroshi, 3,906,517.
Urion, Howard K.: *See—*
Perkins, Melvin A.; and Urion, Howard K., 3,905,949.
Urquhart, George B.: *See—*
Barr, Charles; and Urquhart, George B., 3,905,297.
Ushio, Masatoshi, to Glory Kogyo Kabushiki Kaisha. Coin wrapping apparatus. 3,905,176, Cl. 53-212.000.
V. E. Anderson Manufacturing Company: *See—*
Anderson, Richard N., 3,905,154.
Vaca, Humberto. Egg aid. 3,905,287, Cl. 99-571.000.
Valentin, Guenter: *See—*
Nieswandt, Werner; Hoerauf, Werner; Guenther, Ernst; Kissel, Ernst; Neumann, Eckart; and Valentin, Guenter, 3,905,946.
Valmet Oy: *See—*
Holm, Pekka, 3,905,288.
Van Dorn Company: *See—*
Dragomier, John D.; and Stargell, Donald E., 3,905,514.
VanDeberg, Walter H., to F. Joseph Lamb Company. Machine loader transfer mechanism including a transfer lever with an operably associated stop arm. 3,905,466, Cl. 198-25.000.
van der Lely, Ary: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 3,905,737.
van der Lely, Cornelis. Wagons having loading and unloading equipment. 3,905,498, Cl. 214-317.000.

van der Lely, Cornelis; and van der Lely, Ary. Devices for compressing crop. 3,905,737, Cl. 425-363.000.

Van Etten, Paul, to United States of America, Air Force. Short pulse RF generator. 3,906,252, Cl. 307-106.000.

Van Hattum, Johannes Simon Albert, to U.S. Philips Corporation. Circuit arrangement for producing a sawtooth current through a line deflection coil in an image display apparatus. 3,906,307, Cl. 315-408.000.

Van Horn, Maurice H.: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,906,087.

Vanlerberghe, Guy; and Sebag, Henri, to Societe Anonyme dite: L'Oreal. Surface active agent containing hydroxylatid alkylthio chains. 3,906,048, Cl. 260-609.00R.

van Straaten, Jan, to U.S. Philips Corporation. Circuit arrangement for generating a control signal for the field output stage in a television receiver. 3,906,155, Cl. 178-69.5TV.

Vargiu, Silvio; Carpaneti, Edoardo; Passalenti, Beppino; and Paparatto, Pietro, to Societa' Italiana Resine S.I.R. S.p.A. Process for the preparation of petroleum resins. 3,905,948, Cl. 260-82.000.

Varian Associates: *See—*
Vogel, Thomas M., 3,906,233.

Varta Batterie A.G.: *See—*
Salamon, Klaus; Busch, Heinrich; and Zander, Eberhard, 3,906,330.

Vartikian, Onick M.: *See—*
Peterson, Dale S.; Vartikian, Onick M.; and Fieri, Anthony J., 3,905,478.

Vas, Ivan: *See—*
Nagy, Istvan; Sulyok, Pal; Vas, Ivan; and Viragh, Istvan, 3,905,258.

Vater, Wulf: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,905,970.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,905,983.

VEDA, Inc.: *See—*
Johnson, Roger L., 3,905,725.

Veeder Industries, Inc.: *See—*
Smilgys, Bruno S., 3,906,206.

Velishek, Francis P.; and Bonnie, G. Patrick, to Control Data Corporation. Plated wire memory. 3,906,467, Cl. 340-174.0PW.

Vereecke, Frank J.: *See—*
Hemsath, Klaus H.; and Vereecke, Frank J., 3,905,751.

Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH: *See—*
Sittmann, Brigitte, 3,905,611.

Verma, Jugal K.; and Keprta, Buran I., Jr., to Aeronutronic Ford Corporation. Built-in television console antenna. 3,906,506, Cl. 343-702.000.

Verrier, Jean: *See—*
Belloc, Andre; Florent, Jean; Mancy, Denise; and Verrier, Jean, 3,906,113.

Vervloet, Christiaan, to Shell Oil Company. Process for preparing polyurethane products. 3,905,925, Cl. 260-2.5BD.

Victor Comptometer Corporation: *See—*
Mattedi, Bruno A.; and Nemivant, Jitendra G., 3,906,453.
Mattedi, Bruno A.; and Guagliardo, John J., 3,906,457.

Victor E. Carbonara, Inc.: *See—*
White, Robert E., 3,906,223.

Vidal, Pierre: *See—*
Gibert, Guy; and Vidal, Pierre, 3,906,249.

Vieira, Joseph G.; and Plouffe, Leo A., to Texas Instruments, Incorporated. Time delay circuit employing field effect transistor and differential operational amplifier. 3,906,248, Cl. 307-293.000.

Vilardi, Frank: *See—*
Meshbane, Alex; and Vilardi, Frank, 3,906,293.

Villalobos, Joseph Alfred; and Elnicki, Walter Joseph, to AER Corporation. Incinerator hot oil recovery system. 3,905,126, Cl. 34-72.000.

Villella, Tony R. Internal combustion engine. 3,905,344, Cl. 123-75.00C.

Vincent, David N.; and Golden, Ronald R., to Champion International Corporation. Self-contained pressure-sensitive system. 3,906,123, Cl. 427-145.000.

Vincent, Michel; Remond, Georges; and Laubie, Michel, to Science Union et Cie, Society Francaise de Recherche Medicale. Dibenzocycloheptenes substituted. 3,906,040, Cl. 260-558.00R.

Vincent, Raymond A. Electronic player piano with record and playback feature. 3,905,267, Cl. 84-115.000.

Vinogradov, Vladimir Alexeevich: *See—*
Lepp, Vladimir Romanovich; Vinogradov, Vladimir Alexeevich; Sibgatulin, Kharis Malikovich; and Cherkasov, Jury Nikolaevich, 3,906,289.

Viragh, Istvan: *See—*
Nagy, Istvan; Sulyok, Pal; Vas, Ivan; and Viragh, Istvan, 3,905,258.

Viscose Development Company Limited: *See—*
Jones, David Thomas; Rees, Kenneth Rowland; and Jowett, George Edward, 3,905,954.

Vistron Corporation: *See—*
Townsend, John K.; and Sanford, Chester E., 3,905,858.

Vits, Hilmar. Compact burner for dryers. 3,905,753, Cl. 431-284.000.

Vlasov, Pavel Semenovich; Ivanov, Alexandr Karlovich; Svechnikov, Erik Nikolaevich; Sidorov, Ivan Nikolaevich; Tjurin, Nikolai Kuzmich; Boldov, Valentin Ivanovich; and Koloskov, Vladimir Vasilievich. Centrifugal extractor. 3,905,546, Cl. 233-10.000.

Voegeli, Otto, to International Business Machines Corporation. Semicircular magnetic domain propagation apparatus. 3,906,468, Cl. 340-174.0TF.

Vogel, Thomas M., to Varian Associates. System and method for administering radiation. 3,906,233, Cl. 250-355.000.

Vogelsanger, Emil, to Reishauer AG. Thread grinding machine with a device for the relief grinding of the threads on tap drills and internal thread formers. 3,905,156, Cl. 51-46.000.

Von Roll AG: *See—*
Meister, Erwin, 3,905,301.

Von Alven, Raymond D.: *See—*
Lewis, Dan, Jr.; Von Alven, Raymond D.; and Prouty, Myron R., 3,905,368.

von der Eltz, Hans-Ulrich: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 3,905,764.

von Dreusche, Charles F., Jr., to Nichols Engineering & Research Corporation. Apparatus and method for distributing material being processed over a furnace hearth floor. 3,905,757, Cl. 432-18.000.

von Strandtmann, Maximilan: *See—*
Klutchko, Sylvester; and von Strandtmann, Maximilan, 3,906,005.

Vratny, Frederick: *See—*
Smith, George Elwood; and Vratny, Frederick, 3,906,543.

Vuchelich, Mario. Convertible bed sofa. 3,905,053, Cl. 5-17.000.

Vuilleumier, Maurice: *See—*
Grimm, Maurice; and Vuilleumier, Maurice, 3,905,666.

Vydra, Charles: *See—*
Gulyas, James W.; and Vydra, Charles, 3,905,900.

Vyzkumny a vyvojovy ustav Avodu vseobecneho strojirenstvi: *See—*
Jansa, Milos; Bezdek, Miloslav; and Spisiak, Juraj, 3,905,402.

w. C. Heraeus GmbH: *See—*
Mai, Gerhard; and Siepmann, Reiner, 3,905,918.

W. R. Grace & Co.: *See—*
Billings, Charles Alden; O'Neill, Gerald Joseph; and Simons, Charles William, 3,906,111.
Goytisolo, Jorge Alberto; Chi, Donald Dongsuk; and Lee, Hanjú, 3,906,076.
Holdsworth, Robert S.; Billings, Charles A.; and O'Neill, Gerald J., 3,906,052.

W. R. Weaver Company: *See—*
Steck, William F., III, 3,905,708.

Wada, Toshio: *See—*
Akahane, Fumitake; Iwakawa, Tsunekiyo; Imai, Hideyo; Okazaki, Hiroshi; and Wada, Toshio, 3,906,286.

Wafios, Maschinenfabrik, Wagner, Ficker & Schmid: *See—*
Lange, Gerhard, 3,906,182.
Lange, Gerhard, 3,906,183.

Wagner, Joachim: *See—*
Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, 3,905,420.

Wagner, Richard L.: *See—*
Boardman, Harold; and Wagner, Richard L., 3,905,816.

Walke, Earl W., Jr.: *See—*
Egleston, Harry B.; Lisiecki, Robert E.; Crawford, Duncan J.; Bruan, Eric A.; and Walke, Earl W., Jr., 3,905,280.

Walker, Edwin Stanley: *See—*
Quesnel, Peter Gregory; Lambrou, Andreas; and Walker, Edwin Stanley, 3,906,116.

Walker, John. Self-locking railroad spike. 3,905,549, Cl. 238-369.000.

Walker, Ross Weldon: *See—*
Williams, Raymond Leroy; and Walker, Ross Weldon, 3,905,426.

Wall, Robert N., Jr. Mini-plant for batching and mixing materials. 3,905,586, Cl. 259-154.000.

Wallace, Harry G.: *See—*
Prestridge, Floyd L.; Wallace, Harry G.; and Meyers, Rex T., 3,905,891.

Wallace Industries Company: *See—*
Carroll, Wallace E.; and Jackson, Richard D., 3,905,769.

Wallis, Marvin E. Piston engine employing hydraulic motion conversion. 3,905,339, Cl. 123-46.00R.

Wallman, Leslie B. Agitating device. 3,905,585, Cl. 259-111.000.

Walmsley, Keith: *See—*
Kidd, Alan Lister; Eaves, Douglas; and Walmsley, Keith, 3,906,414.

Walser, Armin: *See—*
Surmatis, Joseph Donald; and Walser, Armin, 3,906,047.

Walter Kidde & Co., Inc.: *See—*
Greenwald, Harry; and Sherman, Perry, 3,905,460.

Walton, Barbara Simon. Music stencil. 3,905,117, Cl. 33-174.00B.

Walz, Klaus: *See—*
Hendricks, Udo-Winfried; and Walz, Klaus, 3,906,063.

Wang, Donald G. J., to Aqua-Chem, Inc. Ultrafiltration and electrodialysis method and apparatus. 3,905,886, Cl. 204-180.00P.

Wankel G.m.b.H.: *See—*
Ruf, Max, 3,905,730.

Wanner, Jochen: *See—*
Kompa, Karl L.; Gensel, Peter; and Wanner, Jochen, 3,906,395.

Ward, Walter D.: *See—*
Levin, Donald; and Ward, Walter D., 3,905,378.

Warner-Lambert Company: *See—*
Klutchko, Sylvester; and von Strandtmann, Maximilan, 3,906,005.
Morrison, Glenn C.; and Cetenko, Wiaczeslaw A., 3,906,099.
Satzinger, Gerhard; and Herrmann, Manfred, 3,905,978.
Wittekind, Raymond R.; and Shavel, John, Jr., 3,905,992.
Zinnes, Harold; and Lindo, Neil A., 3,905,997.

Washschynsky, Bohdan; and Stone, Rex D., to Rockwell International Corporation. Ink mist suppression roller assembly for a rotary printing press. 3,905,296, Cl. 101-348.000.

Wassilieff, Victor. Stopper, particularly for pressurised containers. 3,905,502, Cl. 215-250.000.

Watanabe, Akinori; and Tanoshima, Katsuhide, to Oki Electric Industry Co., Ltd. Method and apparatus for testing an aperture board in a high speed printer. 3,906,355, Cl. 324-33.000.

Watanabe, Atsumi; Amano, Hisao; and Isono, Akira, to Hitachi, Ltd. Frequency regulating device for A.C. systems interconnected through D.C. systems. 3,906,335, Cl. 321-2.000.

Watanabe, Kiyoshi; Tanaka, Tutomu; Hirakawa, Tamotsu; Kinoshita, Hideaki; Sasaki, Mamoru; and Obayashi, Koji, to Kanegafuchi Chemical Industries. Process for production of L-lysine by fermentation. 3,905,866, Cl. 195-28.00R.

Watanabe, Kiyoshi: *See*—
Kanai, Hiromi; Watanabe, Kiyoshi; and Yamazaki, Eiichi, 3,905,079.

Watanabe, Toshio: *See*—
Kimura, Tsuguo; Soga, Setsuo; and Watanabe, Toshio, 3,905,331.

Watanabe, Yusaku; Ikemori, Masayuki; and Kitakata, Tuneharu, to Japanese National Railways. Movable girder type high speed turnout device. 3,905,568, Cl. 246-430.000.

Waterston, William. Back flow preventor. 3,905,382, Cl. 137-102.000.

Watkins, Berne A.; and Sedore, James. Modularized building system. 3,905,167, Cl. 52-79.000.

Watson, Leon, Sr. Safety binder. 3,905,578, Cl. 254-75.000.

Watson, Richard N.: *See*—
Sowards, Donald Maurice; and Watson, Richard N., 3,905,775.

Watts, Leonard, to Technicon Instruments Corporation. Continuous casting apparatus with resilient graphitic sealing element. 3,905,418, Cl. 164-260.000.

Wayne, Mark, to Planet Corporation. Frame handler with improved carriage assembly. 3,905,495, Cl. 214-91.00R.

Wean United, Inc.: *See*—
Shumaker, Charles Storer, 3,905,485.

Weavell, Jack; and Porter, James H., to CAE Machinery Ltd. Bandmill strain system. 3,905,266, Cl. 83-819.000.

Webasto-Werk W. Baier KG: *See*—
Bienert, Horst, 3,905,641.
Lutz, Alfons, 3,905,640.

Webb, Darryl S.: *See*—
Runyon, F. Sheldon; Strantz, Lawrence D.; Webb, Darryl S.; and Phenix, Charles E., 3,905,438.

Webber, J. Alan, to Eli Lilly and Company. Process for preparing primary 3-carbamoyloxymethyl cephalosporins. 3,905,963, Cl. 260-243.00C.

Weber, German: *See*—
Andelfinger, Claus; Dommaschk, Walter; Ott, Werner; Ulrich, Manfred; and Weber, German, 3,906,280.

Weber, Jean, to Ceraver. Tunnel kiln for heat treatment of cylindrical products. 3,905,759, Cl. 432-14.4.000.

Weber, Willi: *See*—
Deubel, Karl; Weber, Willi; and Schuchmann, Dieter, 3,905,206.

Webster Electric Company, Inc.: *See*—
Lourigan, Ronald F., 3,906,294.

Week, Nils P.; Shellman, Carl E.; and Koivunen, Erkki A., to General Motors Corporation. Rotary timing valve. 3,905,274, Cl. 91-6.500.

Wehr Corporation: *See*—
Busse, Floyd E.; and Theis, Leon J., 3,905,284.

Weidner, Peter: *See*—
Grossmann, Gunter; Kern, Peter; Kotter, Karl-Heinz; Schaffer, Bernhard; Schmid, Lothar; Thilenius, Arnulf; and Weidner, Peter, 3,906,151.

Weil, Edward D., to Stauffer Chemical Company. Process of flame retarding substrates by applying hexahydratriazine phosphonate derivatives. 3,906,136, Cl. 428-262.000.

Weil-McLain Company, Inc.: *See*—
Fowler, Kirk; and Deters, Elmer M., 3,905,405.

Weiss, Charles M.; and Judy, Kenneth, to Oratronics, Inc. Intramucosal denture system. 3,905,108, Cl. 32-10.00A.

Weiss, Richard: *See*—
Schneider, Ernst; Simon, Manfred; Weiss, Richard; Hover, Alexander; and Treutler, Christian, 3,906,065.

Weissman, Eugene Yehuda; and Mahato, Basanta Kumar, to Globe-Union Inc. Lead-acid battery plate with low dusting characteristics and method of manufacture. 3,905,829, Cl. 136-26.000.

Welding Institute, The: *See*—
Houldcroft, Peter T., 3,905,092.

Welty, Richard K., to Exxon Nuclear Company Inc. Fluidized reactor reduction of UF_6 to UO_2. 3,906,081, Cl. 423-261.000.

Wenrich, Carl M.; and Hoverter, Bryce E., Jr., to Teledyne Mid-America Corporation. Automatic positioning mechanism. 3,906,328, Cl. 318-612.000.

Werkowski, Ryszard: *See*—
Lewandowski, Witold; Werkowski, Ryszard; and Gliszewski, Henryk, 3,905,434.

Wesserling, William R.: *See*—
Guadara, Joseph G.; and Wesserling, William R., 3,906,472.

West Electric Company, Ltd.: *See*—
Toyoshima, Sakae; and Sawada, Yasunori, 3,906,526.

West, John Barth. Automatic container capping and dispensing device. 3,905,178, Cl. 53-328.000.

Westerlund, Gunnar J., to AB Hagglund & Soner. Equipment for moving material on reels, in particular paper reels and similar. 3,905,636, Cl. 294-95.000.

Western Electric Company, Incorporated: *See*—
Schmehl, Glenn Lewis, 3,905,537.

Western Geophysical Company of America: *See*—
Ross, Walter T., deceased, 3,905,446.

Westinghouse Air Brake Company: *See*—
Harrison, John R., 3,906,349.
Hyler, John H., 3,905,136.
Runyon, F. Sheldon; Strantz, Lawrence D.; Webb, Darryl S.; and Phenix, Charles E., 3,905,438.

Westinghouse Electric Corporation: *See*—
Bennett, Allan I., 3,906,381.
Blaha, Franklyn C.; and Oehler, Harry G., 3,906,359.
Melvin, Waymon A., Jr.; and Lipscomb, George W., 3,906,484.
Murdock, Lawrence C., 3,906,353.
Murdock, Lawrence C., 3,906,354.
Murdock, Lawrence C., 3,906,391.
Pearson, Robert C., 3,905,778.
Schirmer, Ernest J., 3,905,452.
Taylor, John W., Jr., 3,906,498.

Wheelchairs, Inc.: *See*—
Karchak, Andrew, Jr.; and Allen, James R., 3,905,436.

Whirlpool Corporation: *See*—
Getz, Edward H.; and DeSchaaf, Clifford L., 3,906,341.
Pfouts, John Richard, 3,906,342.

White, Brian Graham: *See*—
Barlow, Charles Brian; White, Brian Graham; and Tomlin, Clive Dudley Spencer, 3,906,098.

White, Derek Graham Walter: *See*—
Curry, Harold George; Attwood, Brian William; and White, Derek Graham Walter, 3,905,864.

White, Ralph L., Jr.: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,906,010.

White, Robert E., to Victor E. Carbonara, Inc. Encoder for altimeters. 3,906,223, Cl. 250-231.0SE.

White, Ronald E.: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,906,010.

Whitehouse, Harper J.: *See*—
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,906,434.
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,906,435.

Whitehouse, Harper John, to United States of America, Navy. Variable impedance delay line correlator. 3,906,409, Cl. 333-29.000.

Whitehurst, Gerald E.: *See*—
Maguire, Roy L.; Kupfert, Bernard F.; and Whitehurst, Gerald E., 3,905,607.

Whiting, Harold F.; and Nelson, Herbert P., to Hilsinger Corporation, The. Method of securing a front hinge to an eyeglass frame front. 3,905,085, Cl. 29-418.000.

Whitney, Wendell K.: *See*—
Kushlefsky, Bernard G.; and Whitney, Wendell K., 3,906,103.

Wiart, Albert, to Jeumont-Schneider. Device for regulating and switching currents from a constant D.C. source into the windings of an A.C. machine. 3,906,314, Cl. 318-138.000.

Wiechert, Rudolf: *See*—
Laurent, Henry; Wiechert, Rudolf; Prezewowsky, Klaus; Hofmeister, Helmut; Gerhards, Erich; Kolb, Karl Heinz; and Mengel, Klaus, 3,906,095.

Wijsboom, Dan Bernardus, to U.S. Philips Corporation. Arrangement provided with a gas and/or vapour discharge lamp. 3,906,302, Cl. 315-209.000.

Wilcox, Alan A.: *See*—
Carroll, Wallace E.; and Jackson, Richard D., 3,905,769.

Wiley, David, to Lucas Electrical Company, Limited, The. Film circuit assemblies. 3,906,144, Cl. 174-52.00S.

Wilhelm Leeser GmbH & Co. KG.: *See*—
Neumann, Kurt, 3,905,733.

Will Ross, Inc.: *See*—
Le Vine, Harris D., 3,906,473.

Wm. T. Burnett & Co., Incorporated: *See*—
Tucker, Richard B. C.; and Crawford, William C., 3,905,088.

Williams, Chester I. Method of erecting wall-form. 3,905,093, Cl. 29-526.000.

Williams, G. Norman, to GTE Sylvania Incorporated. Surface wave device and method of making. 3,906,410, Cl. 333-30.00R.

Williams, Hugh A., Jr., to General Motors Corporation. Shock proof engine overspeed control. 3,905,348, Cl. 123-198.00D.

Williams, Louis Val. Method of applying stones to sheet material. 3,905,848, Cl. 156-63.000.

Williams, Raymond Leroy; and Walker, Ross Weldon, to Dresser Industries, Inc. Earth boring machine positioning system. 3,905,426, Cl. 173-1.000.

Williams, Richard H.: *See*—
Gosswiller, Earl W.; Hsu, Dick T.; Williams, Richard H.; and Iacono, Joel G., 3,906,491.

Williams, Robert E.: *See*—
Decker, Thomas A.; Kuether, Christian L.; Williams, Robert E.; and Logar, Noel D., 3,905,688.

Williams, William H.: *See*—
Griffin, Donald E.; Brown, Byron T.; and Williams, William H., 3,905,874.

Williamson, James Byron. Pressure oiling system and oiling valve assembly. 3,905,451, Cl. 184-7.00D.

Willis, Arnold L.; and Wortman, Harold, to CWW Research and Development Company. Fiber-filled pillow. 3,905,057, Cl. 5-337.000.

Willis, Donald Henry, to RCA Corporation. High voltage protection circuit. 3,906,304, Cl. 315-379.000.

Willmott, Colin B., to Chamberlain Manufacturing Corporation. Digital radio control. 3,906,348, Cl. 325-37.000.

Willow Hill Industries, Inc.: *See*—
Tetlak, Joseph F., 3,905,086.

Willy Sauter KG: *See*—
Thumm, Helmut; and Kettel, Hans, 3,905,257.

Wilson, David T.: *See*—
DeMeester, Gordon D.; Barrett, Harrison H.; and Wilson, David T., 3,906,229.

Wilson, Geoffrey R.: *See*—
Christman, Robert D.; Henke, Alfred M.; Paraskos, John A.; Wilson, Geoffrey R.; and Yanik, Stephen J., 3,905,893.

Wimmer, Josef, to Siemens Aktiengesellschaft. Rod core choke for suppressor application in phase-gating circuits. 3,906,421, Cl. 336-178.000.

Windsor, Robert K.; and Windsor, Ronald. Vehicle for paralyzed persons. 3,905,054, Cl. 5-81.000.

Windsor, Ronald: *See*—
Windsor, Robert K.; and Windsor, Ronald, 3,905,054.

Wingfield, Joanna, legal representative: *See*—
Wingfield, Peter Maurice, deceased; and Wingfield, Joanna, legal representative. 3,906,340.

Wingfield, Peter Maurice, deceased; and by Wingfield, Joanna, legal representative. Tuned circuit monitor for structural materials. 3,906,340, Cl. 324-57.00Q.

Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. 1-Alkyl-2-(pyridylsulfinylmethyl)-5-nitro-imidazoles and 1-alkyl-2-(pyridylsulfonylmethyl)-5-nitro-imidazoles. 3,905,985, Cl. 260-294.80F.

Winkler, Gerhard: *See*—
Sauermann, Heinz; and Winkler, Gerhard, 3,906,539.

Winter, Heinrich: *See*—
Betz, Hans; Merz, Dietrich; Winter, Heinrich; and Ahlborn, Hans, 3,905,083.

Winter, Karl; and Staschik, Gunter, to Ceag Dominit, Aktiengesellschaft. Method of purifying an air or gas flow of vaporous or gaseous impurities adsorbable in filters. 3,905,783, Cl. 55-31.000.

Winter, Roy Paul, to American Sterilizer Company. Knee osteotomy blade. 3,905,374, Cl. 128-317.000.

Wira and Mather & Platt, Ltd.: *See*—
Bissitt, Ian Stockwell, 3,905,765.

Wirfelt, Sven Axel Olof, to Sandvik Aktiebolag. Tool holder. 3,905,081, Cl. 29-96.000.

Wirth, Friedrich; Buerger, Gert; Wagner, Joachim; Schoenberger, Eberhard; Kassat, Harry; and Kolenda, Herbert, to BASF Aktiengesellschaft. Desublimer for the recovery of sublimed products, particularly phtalic anhydride, from reaction gases. 3,905,420, Cl. 165-82.000.

Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lam, Hing-Yat, 3,906,014.

Wise, Joseph Agusta: *See*—
Pritulsky, James; Reynolds, Charles Edward; and Wise, Joseph Agusta, 3,905,475.

Wisnia, Jeffry A., to Scully Signal Company. Fuel oil delivery truck pumping system. 3,905,516, Cl. 222-63.000.

Wittekind, Raymond R.; and Shavel, John, Jr., to Warner-Lambert Company. N,N'-alkylenebis(2-amino-1-(2-imidazolin-2-yl)-2-imidazolines). 3,905,992, Cl. 260-309.600.

Wittes, James M., to Thomas & Betts Corporation. Foil connector. 3,906,148, Cl. 174-84.00R.

Wittkopf, Eugene W.: *See*—
Spencer, Harvey J.; and Wittkopf, Eugene W., 3,905,592.

Wittkopp, Fritz: *See*—
Schorr, Hermann; Schaefer, Willi; Finkenzeller, Johann; and Wittkopp, Fritz, 3,905,591.

Woelz, Donald D.: *See*—
O'Callaghan, Gerald F.; and Woelz, Donald D., 3,906,327.

Woodhour, Allen F.: *See*—
Hilleman, Maurice R.; Tytell, Alfred A.; and Woodhour, Allen F., 3,906,092.

Woodward, Bruce C., to Kennametal Inc. Die member for briquetting apparatus. 3,905,744, Cl. 425-471.000.

Woodward, Charles D., to Texaco Inc. Method for recovering viscous petroleum. 3,905,422, Cl. 166-245.000.

Worcester Pressed Aluminum Corporation: *See*—
Bradley, Earl H., 3,905,409.

Wortman, Harold: *See*—
Willis, Arnold L.; and Wortman, Harold, 3,905,057.

Wright, David M.: *See*—
Dean, Carl J.; Wright, David M.; and Cournoyer, Bernard T., 3,905,484.

Wright, George C.: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,906,010.

Wright, John R. Ultrasensitive force measuring instrument employing torsion balance. 3,905,215, Cl. 73-382.000.

Wright, Robert M.; and Johncock, Allan W., to Standard Oil Company, The. Control apparatus for fractionation tower. 3,905,873, Cl. 202-160.000.

Wristers, Harry J., to Exxon Research and Engineering Company. Multiple-step procedure for producing a polymerization catalyst. 3,905,915, Cl. 252-429.00A.

Wyhof, John R., to ICI United States Inc. Low weight photoconductive compositions. 3,905,813, Cl. 96-1.500.

Wynn, Robert W.: *See*—
Randall, David I.; and Wynn, Robert W., 3,905,799.

Xerox Corporation: *See*—
Cook, John Hayward, 3,905,247.
DuPree, Donald G.; Bailey, Raymond E.; and Ling, Chester H. K., 3,905,400.
Fairbairn, Douglas G., 3,906,194.
Fraser, Lawrence J.; and Parker, Delmer G., 3,906,121.
Gunther, Wolfgang H. H., 3,905,958.
Harper, David C.; McCrobie, George L.; Price, Edgar E.; and Ritter, Joachim A., 3,905,685.
Harris, Lee B., 3,905,812.
Marks, Lawrence M., 3,905,822.
Thornburg, David D.; and Johnson, Richard I., 3,906,537.

Xynetics, Inc.: *See*—
Garretson, Oliver R.; and Harmon, Richard C., 3,905,098.

Yadon, Donald E., to United Hydraulics Corporation. Piston and cylinder assembly with external mechanical lock. 3,905,279, Cl. 92-13.800.

Yagi, Eigo; and Shiraishi, Keiichi. Size control device for continuously produced elongate object. 3,906,238, Cl. 250-548.000.

Yamada, Yujiro: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Yamaguchi, Yoshiharu: *See*—
Hasegawa, Akira; Yamaguchi, Yoshiharu; and Matsuda, Yoshio, 3,905,072.

Yamamoto, Hisao: *See*—
Akatsu, Mitsuhiro; Kume, Yoshiharu; Hirohashi, Toshiyuki; Inaba, Shigeho; Yamamoto, Hisao; and Sato, Hiromi, 3,906,003.

Yamanaka, Tadashi: *See*—
Shiraishi, Tadashi; and Yamanaka, Tadashi, 3,905,844.

Yamauchi, Satoshi: *See*—
Koizumi, Masami; and Yamauchi, Satoshi, 3,905,128.

Yamazaki, Eiichi: *See*—
Kanai, Hiromi; Watanabe, Kiyoshi; and Yamazaki, Eiichi, 3,905,079.

Yanagi, Osamu: *See*—
Takeda, Nobuhiro; Yanagi, Osamu; Mizuno, Shigeo; and Hayashi, Toyoshi, 3,905,121.

Yanagisawa, Yuzuru, to Sony Corporation. Indicator display tube having predetermined spacing between base plate and cover. 3,906,287, Cl. 313-519.000.

Yanik, Stephen J.: *See*—
Christman, Robert D.; Henke, Alfred M.; Paraskos, John A.; Wilson, Geoffrey R.; and Yanik, Stephen J., 3,905,893.

Yao, Toshio: *See*—
Enoki, Kichiji; Yao, Toshio; Ishimitsu, Keiichi; Tsukashima, Keiichi; and Ikari, Eiichi, 3,905,995.

Yarnall, Paul J.: *See*—
Ensslin, Frieder H.; and Yarnall, Paul J., 3,906,227.

Yasumoto, Koji: *See*—
Oba, Seiichiro; Tabuse, Akira; and Yasumoto, Koji, 3,906,059.

Yatagai, Shukuro; and Tamura, Katunori, to Japanese National Railways. Load shifting type cargo moving device. 3,905,494, Cl. 214-89.000.

Yatrides, George Alexandre. Cigarette having a blind conduit. 3,905,377, Cl. 131-9.000.

Yawata, Kazufumi: *See*—
Kobayakawa, Masaki; and Yawata, Kazufumi, 3,906,285.

Ylinen, William A. Cable laying attachment for vehicles. 3,905,200, Cl. 61-72.600.

Yokoyama, Masato, to Kabushiki Kaisha Suehiro Sharyo Seisakusho. Trailers. 3,905,620, Cl. 280-419.000.

Yonan, Peter K., to G. D. Searle & Co. 1-Aryl-n-dialkylaminoalkyl-3,4-dihydro-2(1H)-isoquinolinecarboxamides and related compounds. 3,905,982, Cl. 260-287.00R.

Yonehara, Masanori: *See*—
Nishimura, Shojiro; and Yonehara, Masanori, 3,905,428.

Yoneyshi, Yukio: *See*—
Nagase, Tsuneyuki; Suzukamo, Gohu; Yoneyshi, Yukio; and Yoshioka, Hirosuke, 3,906,026.

Yonezu, Hisashi, to Nippondenso Co., Ltd. Warning system. 3,906,476, Cl. 340-253.00R.

Yoshida, Hiroshi; Sasai, Kazuyoshi; and Kubomatsu, Teruo, to Nippon Soda Company, Limited. Process for the production of 2-amino-1-butanol. 3,906,046, Cl. 260-584.00R.

Yoshida, Hiroshi; Ando, Noriyoshi; and Oishi, Kazuo, to Nippondenso Co., Ltd. Electrical fuel control system for internal combustion engines. 3,906,205, Cl. 235-150.210.

Yoshida, Kenichi: *See*—
Kurauchi, Noritaka; Yoshida, Kenichi; Kobayashi, Yoshinobu; and Kuroda, Masataka, 3,906,436.

Yoshida, Kenji: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Fukuroi, Takeo, 3,905,073.
Hasegawa, Akira; Yamaguchi, Yoshiharu; and Matsuda, Yoshio, 3,905,072.

Yoshida, Osamu: *See*—
Hosokoshi, Kakuichiro; and Yoshida, Osamu, 3,906,515.

Yoshikawa, Motohiko; Shimizu, Yoshiaki; Tanaka, Yoshiharu; and Ishii, Kazuo, to Nippon Kayaku Kabushiki Kaisha. 4,4'-Diaminostilbene-2,2'-disulfonic acid derivatives and processes using same. 3,905,964, Cl. 260-240.00B.

Yoshino, Kimiaki; Adachi, Kinichi; Shimotsuma, Wataru; Sekine, Yoichi; and Shimizu, Toshio, to Matsushita Electric Industrial Co., Ltd. Electrorecording sheet. 3,905,876, Cl. 204-2.000.

Yoshioka, Hirosuke: *See*—
Nagase, Tsuneyuki; Suzukamo, Gohu; Yoneyshi, Yukio; and Yoshioka, Hirosuke, 3,906,026.

Yoshizaki, Akira: *See*—
Ueda, Hiroshi; and Yoshizaki, Akira, 3,906,519.

You, Chia-Nien: *See*—
Pelosi, Stanford S., Jr.; White, Ronald E.; White, Ralph L., Jr.; Wright, George C.; and You, Chia-Nien, 3,906,010.

Young, Lewis Brewster: *See*—
Jurewicz, Anthony T.; Young, Lewis Brewster; and Chu, Chin-Chiun, 3,905,914.

Youngquist, David Jack: *See*—
Smith, Woodrow Wilson; and Youngquist, David Jack, 3,905,403.

Yovkov, Yovko Nikolov: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Yu, Robert Tapei, to Motorola, Inc. MOS memory system. 3,906,463, Cl. 340-173.00R.

Yuda, Yasukatsu: *See*—
Hidaka, Hidemasa; Yoshida, Kenji; Shibata, Uichi; Yuda, Yasukatsu; Niwa, Tomizo; Goi, Hitoshi; Miyado, Shinji; Yamada, Yujiro; Koeda, Takemi; and Saito, Kazuo, 3,905,869.

Yule, Roger T.: *See*—
Smalarz, Anthony A.; and Yule, Roger T., 3,905,237.

Zaborsky, George: *See*—
Tamburino, James C.; and Zaborsky, George, 3,905,616.

Zaffaroni, Alejandro, to Alza Corporation. Intrauterine device for governing the reproductive process. 3,905,360, Cl. 128-130.000.

Zaiser, Wolfgang, to Daimler-Benz Aktiengesellschaft. Automatic planetary gear change-speed transmission for motor vehicles. 3,905,252, Cl. 74-759.000.

Zander, Eberhard: *See*—
Salamon, Klaus; Busch, Heinrich; and Zander, Eberhard, 3,906,330.

Zanetti, Guido: *See*—
Hellerbach, Joseph; and Zanetti, Guido, 3,906,025.

Zappe, Hans H.: *See*—
Matisoo, Juri; and Zappe, Hans H., 3,906,538.

Zashev, Ivan Zahariev: *See*—
Stoilov, Ivan Kostadinov; Ralchev, Pencho Ivanov; Korudanov, Georgi Nikolov; Starev, Lyuben Rangelov; Grigorov, Ivaylo Yanev; Shikov, Todor Vassilev; Kirev, Kiril Spassov; Zashev, Ivan Zahariev; Yovkov, Yovko Nikolov; Apostolov, Kostadin Dimitrov; Ivanov, Georgi Iliev; and Mutafchiev, Stoycho Ivanov, 3,905,802.

Zeeh, Bernd; Jung, Johann; Rentzea, Costin; and Koenig, Karl-Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Plant growth regulators. 3,905,798, Cl. 71-76.000.

Zeewy, Abraham: *See*—
Cohen, Bernard D.; and Zeewy, Abraham, 3,905,109.

Zem of Wales Limited: *See*—
Szomanski, Zbigniew Janusz, 3,905,069.

Zenith Radio Corporation: *See*—
Hendrickson, Melvin C., 3,906,373.
Rhodes, Robert H., 3,906,429.

Zentgraf, Karl-Martin: *See*—
Hausberg, Gerhard; Kruger, Georg; and Zentgraf, Karl-Martin, 3,906,078.

Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Three stage solenoid operated valve assembly. 3,905,575, Cl. 251-30.000.

Zeuthen & Aagaard A/S: *See*—
Zeuthen, Karl Gustav, 3,905,696.

Zeuthen, Karl Gustav, to Zeuthen & Aagaard A/S. Toner system for an electrophotographic copying machine and a copying machine utilizing this toner system. 3,905,696, Cl. 355-10.000.

Ziegert, Richard Melvin, to American Can Company. Water-based film laminating adhesive from poly(ethyl acrylate), poly(ethylene/acrylic acid) and 1,2-epoxy resin. 3,905,931, Cl. 260-29.6NR.

Zimmermann, Frank: *See*—
Ehrmann, Oskar; Zimmermann, Frank; and Friedrich, Ludwig, 3,905,990.

Zimmern, Bernard. Baffle structure for rotary worm compression-expansion machines. 3,905,731, Cl. 418-195.000.

Zinnes, Harold; and Lindo, Neil A., to Warner-Lambert Company. 3-Aryl-5-oxo-2-pyrazoline-4-carboxanilides and process therefor. 3,905,997, Cl. 260-310.00A.

Zoecon Corporation: *See*—
Henrick, Clive A.; and Siddall, John B., 3,906,020.

Zondler, Helmut, to Ciba-Geigy Corporation. Process for the manufacture of 5-amino-2-(β-cyanoethyl)-5-cyclohexen-1-one. 3,905,940, Cl. 260-464.000.

Zurad, Joseph T., to Bodine Electric Company. Electric motor starting circuit. 3,906,316, Cl. 318-221.00D.

Zurn Industries, Inc.: *See*—
Rachocki, Eugene, 3,905,386.

Zusmanovich, Lev Markovich. Air conditioning installation. 3,905,205, Cl. 62-309.000.

Zviak, Charles; and Ghilardi, Giuliana, to Societe Anonyme dite: L'Oreal. Hair-setting lotion containing a reducing agent. 3,906,091, Cl. 424-70.000.

Zweigle Advertising, Inc.: *See*—
Zweigle, Robert D., 3,905,151.

Zweigle, Robert D., to Zweigle Advertising, Inc. Velocipede noisemaker. 3,905,151, Cl. 46-174.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF SEPTEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bevan, James W., to Specialty Engineering & Manufacturing Co. Invisible drive unit for large display signs. Re. 28,549, Cl. 40-33.000.

Breitbach, Johnnie J. Apparatus for transferring trays between a conveyor system and a stack. Re. 28,551, Cl. 214-6.0DS.

Curler, Howard J.; and Lineburg, Glenn E., to Curwood, Inc. Flexible wrapping material. Re. 28,554, Cl. 428-334.000.

Curwood, Inc.: *See*—
Curler, Howard J.; and Lineburg, Glenn E., Re. 28,554.

Du Pont de Nemours, E. I., and Company: *See*—
Smith, Gaylord Darrel, Re. 28,552.

Henkel & Cie GmbH: *See*—
von Freyhold, Helmut, Re. 28,553.

Illinois Tool Works Inc.: *See*—
Koepke, John Albert, Re. 28,555.

Koepke, John Albert, to Illinois Tool Works Inc. Electrical switch having movable spring contacts which provide wiping action with associated stationary contacts. Re. 28,555, Cl. 200-164.00R.

Lineburg, Glenn E.: *See*—
Curler, Howard J.; and Lineburg, Glenn E., Re. 28,554.

Perkins Marine Lamp and Hardware Corporation: *See*—
Perkins, Marvin S., Re. 28,550.

Perkins, Marvin S., to Perkins Marine Lamp and Hardware Corporation. Marine hardware. Re. 28,550, Cl. 114-218.000.

Smith, Gaylord Darrel, to Du Pont de Nemours, E. I., and Company. Cobalt-base alloys. Re. 28,552, Cl. 148-32.000.

Specialty Engineering & Manufacturing Co.: *See*—
Bevan, James W., Re. 28,549.

von Freyhold, Helmut, to Henkel & Cie GmbH. Method for inhibiting corrosion and mineral deposits in water systems. Re. 28,553, Cl. 252-175.000.

LIST OF PLANT PATENTEES

Funk, Cyril R., Jr., to Rutgers University. Kentucky bluegrass. 3,782, 9–16–75, Cl. 88.

Mikkelsen, James C., to Mikkelsens Inc. Begonia plant. 3,783, 9–16–75, Cl. 68.

Mikkelsens, Inc.: *See*—
Mikkelsen, James C. 3,783.

Rutgers University: *See*—
Funk, Cyril R., Jr. 3,782.

LIST OF DESIGN PATENTEES

AB Gustavsbergs Fabriker: *See*—
Benktzon, Maria, and Juhlin. 236,793.

ABU AB: *See*—
Tufvesson, Kent. 236,827.

AMF Inc.: *See*—
Meade, Thomas A. 236,844.

Abrahamsen, Thomas C., and J. D. Zaccai, to RCA Corp. Check-out counter or similar article. 236,780, 9–16–75, Cl. D6—143.

Addmaster Corp.: *See*—
McClurg, Betty L., and Grey. 236,834.

Amdahl Corp.: *See*—
Beall, Robert J. 236,833.

Arctic Pac, Inc.: *See*—
Schmit, Justin M. 236,807.

Bates Industries, Inc.: *See*—
Larsen, Harold H., and Oehring. 236,821.
Larsen, Harold H., and Oehring. 236,822.

Beall, Robert J., to Amdahl Corp. Integrated circuit package. 236,833, 9–16–75, Cl. D26—1.

Benaim, Carlos. Edible spinning toy. 236,845, 9–16–75, Cl. D34—15.

Benktzon, Maria, and S. E. Juhlin, to AB Gustavsbergs Fabriker. Table knife. 236,793, 9–16–75, Cl. D7—137.

Berry, William J. III: *See*—
Berry, William J., Jr., and W. J. III. 236,829.

Berry, William J., Jr., and W. J. Berry III, to R & D Supplies, Inc. Water purification unit. 236,829, 9–16–75, Cl. D23—3.

Bishop, Cecil C. Stroboscopic light unit housing for aircraft. 236,846, 9–16–75, Cl. D48—32.

Blazon-Flexible Flyer, Inc.: *See*—
Speer, Gregory B. 236,766.

Bochmann, Carl E., and D. E. Watkins, to H. D. Hudson Mfg. Co. Cordless electric sprayer. 236,830, 9–16–75, Cl. D23—18.

Breuers, Theo P. C.: *See*—
Lucker, Louis J. H., and Breuers. 236,853.
Lucker, Louis J. H., and Breuers. 236,854.

Bruno, Pasquale N., and J. L. Stewart, to Old Stone Oven Corp. Baking stone. 236,790, 9–16–75, Cl. D7—123.

Bruno, Pasquale N., and J. L. Stewart, to Old Stone Oven Corp. Baking stone. 236,791, 9–16–75, Cl. D7—123.

Cerra, John R. Speaker cabinet. 236,836, 9–16–75, Cl. D26—14.

Champion International Corp.: *See*—
Sanderford, M. Vincent, and Davis. 236,797.

Colberg, Inc.: *See*—
Duecker, Willard J. 236,819.

Columbia Specialty Co., Inc.: *See*—
Paulich, Rudolph. 236,795.

Cowley, Gary. Drafting table. 236,774, 9–16–75, Cl. D6—27.

Cowley, Gary. Single pedestal drafting table. 236,775, 9–16–75, Cl. D6—27.

Cowley, Gary. Combined bookshelf and storage cabinet or similar article. 236,781, 9–16–75, Cl. D6—165.

Culbertson, Richard: *See*—
Lee, Richard E., and Culbertson. 236,837.

D'Addario, Theodore A., and D. R. Estes, to VeloBind, Inc. Tool for debinding documents. 236,794, 9–16–75, Cl. D8—98.

Davis, Paul, D. Schneider, and P. Hollinger, to Sweetheart Plastics, Inc. Package for ice cream cones or the like. 236,805, 9–16–75, Cl. D9—183.

Davis, Philip J.: *See*—
Sanderford, M. Vincent, and Davis. 236,797.

Deffner, John F. Display rack. 236,773, 9–16–75, Cl. D6—25.

Delaney, Edward J. Tap. 236,847, 9–16–75, Cl. D56—4.

Deuschle, Fritz, to Schlueter Mfg. Co. Mop pail. 236,796, 9–16–75, Cl. D7—187.

Dixson, Inc.: *See*—
Lowery, Dennis J., and Rose. 236,813.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display stand. 236,768, 9–16–75, Cl. D6—24.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display stand. 236,769, 9–16–75, Cl. D6—24.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display stand. 236,770, 9–16–75, Cl. D6—24.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display stand. 236,771, 9–16–75, Cl. D6—24.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Display stand. 236,772, 9–16–75, Cl. D6—24.

Draghi, James A., to M. H. Rhodes, Inc. Bell timer. 236,812. 9–16–75, Cl. D10—40.

Duecker, Willard J., to Colberg, Inc. Frame for a railroad rail grinding machine. 236,819, 9–16–75, Cl. D12—42.

Ennis, Gregory A. Bicycle. 236,803, 9–16–75, Cl. D12—111.

Estes, David R.: *See*—
D'Addario, Theodore A., and Estes. 236,794.

Ethyl Development Corp.: *See*—
McDonald, John W. 236,802.
Waring, Donald A. 236,801.

Exhibitech, Inc.: *See*—
Muempfer, William E. 236,783.

Farrough, James W., to Miles Laboratories, Inc. Wire test tube rack. 236,840, 9–16–75, Cl. D32—1.

Ferrero, P., & C., S.p.A.: *See*—
Dogliotti, Amilcare. 236,768.
Dogliotti, Amilcare. 236,769.
Dogliotti, Amilcare. 236,770.

Dogliotti, Amilcare. 236,771.
Dogliotti, Amilcare. 236,772.
General Electric Co.: *See*—
Lee, Richard E., and Culbertson. 236,837.
Grey, Michael W.: *See*—
McClurg, Betty L., and Grey. 236,834.
Hall, Wayne F. Anchor post. 236,798, 9–16–75, Cl. D8—234.
Hamel, Leo A. Utility van having externally accessible compartments. 236,820, 9–16–75, Cl. D12—99.
Hegel, Raymond G. Automobile windshield frame mountable radio-transmitter holder. 236,855, 9–16–75, Cl. D87—1.
Heuer Leonidas S.A.: *See*—
Moutier, Andre M. 236,811.
Hirosawa, Nobuyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Digital clock. 236,810, 9–16–75, Cl. D10—15.
Honeywell, Inc.: *See*—
Quinn, Peter T. 236,851.
House of Health, Inc.: *See*—
Loomis, Roland E. 236,777.
Hudson, H. D., Mfg. Co.: *See*—
Bochmann, Carl E., and Watkins. 236,830.
Hunt, Larry H.: *See*—
Phillips, Robert B., and Hunt. 236,776.
IVAC Corp.: *See*—
Sato, Stephens N. 236,814.
Intex Products, Inc.: *See*—
Kapuscinski, Lucian. 236,799.
Jennings, Wayne B. Dental floss applicator. 236,832, 9–16–75, Cl. D24—1.
Johns-Manville Corp.: *See*—
Middleman, Leo. 236,824.
Middleman, Leo. 236,825.
Juhlin, Sven-Eric: *See*—
Benktzon, Maria, and Juhlin. 236,793.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Hirosawa, Nobuyoshi. 236,810.
Kao, Tonis: *See*—
Kramer, Herbert, and Kao. 236,835.
Kapnek, Bertram H. Coin display case. 236,784, 9–16–75, Cl. D6—168.
Kapuscinski, Lucian, to Intex Products, Inc. Squeeze dispenser for cleaning fluid or the like. 236,799, 9–16–75, Cl. D9—2.
Knodt, Ruediger W., to Xerox Corp. Control panel for a copier. 236,850, 9–16–75, Cl. D61—1.
Kramer, Herbert, and T. Kao, to Siemens Aktiengesellschaft. Data printer. 236,835, 9–16–75, Cl. D26—5.
Kumai, Yasui, to Shiseido Co., Ltd. Receptacle for paste-perfumery. 236,806, 9–16–75, Cl. D9—193.
Larsen, Harold H., and R. E. Oehring, to Bates Industries, Inc. Motorcycle saddle bag. 236,821, 9–16–75, Cl. D12—158.
Larsen, Harold H., and R. E. Oehring, to Bates Industries, Inc. Motorcycle tote box. 236,822, 9–16–75, Cl. D12—158.
Lee, Richard E., and R. Culbertson, to General Electric Co. Portable 8-track stereo tape player. 236,837, 9–16–75, Cl. D26—14.

Lookatch, Gordon D. Wallet. 236,857, 9–16–75, Cl. D87—3.
Loomis, Roland E., to House of Health, Inc. Display unit. 236,777, 9–16–75, Cl. D6—85.
Lowery, Dennis J., and V. H. Rose, to Dixson, Inc. Automotive engine tester. 236,813, 9–16–75, Cl. D10—46.
Lucker, Louis J. H., and T. P. C. Breuers, to Oce-van der Grinten N.V. Document sorter. 236,853, 9–16–75, Cl. D64—11.
Lucker, Louis J. H., and T. P. C. Breuers, to Oce-van der Grinten N.V. Document sorter. 236,854, 9–16–75, Cl. D64—11.
Mallory, P. R., & Co., Inc.: *See*—
Sweany, Louis P. 236,817.
Marrie, Paul A., to SEB. Pancake making appliance. 236,848, 9–16–75, Cl. D55—1.
Martin, Clyde J., to Martin Industries, Inc. Pressure gauge. 236,816, 9–16–75, Cl. D10—85.
Martin Industries, Inc.: *See*—
Martin, Clyde J. 236,816.
McClurg, Betty L., and M. W. Grey, to Addmaster Corp. Fanfold paper tape supply-takeup structure. 236,834, 9–16–75, Cl. D26—5.
McKelvey, John W. Cradle. 236,767, 9–16–75, Cl. D6—15.
McLain, Philippe H. T., to Shakespeare Co. Thread canister. 236,808, 9–16–75, Cl. D9—216.
Meade, Thomas A., to AMF Inc. Bowling lane ball return. 236,844, 9–16–75, Cl. D34—5.
Middleman, Leo, to Johns-Manville Corp. Decorative panel or similar article. 236,824, 9–16–75, Cl. D13—1.
Middleman, Leo, to Johns-Manville Corp. Decorative panel. 236,825, 9–16–75, Cl. D13—1.
Miles Laboratories, Inc.: *See*—
Farrough, James W. 236,840.
Miller, Fidelis L. Back pack cooler. 236,856, 9–16–75, Cl. D87—1.
Minnesota Mining & Mfg. Co.: *See*—
Stenemann, Heinrich F. 236,818.
Miyake, Takao, to Sharp Kabushiki Kaisha. Electronic cooking range. 236,792, 9–16–75, Cl. D7—128.
Moutier, Andre M., to Heuer Leonidas S.A. Stop watch. 236,811, 9–16–75, Cl. D10—30.
Muempfer, William E., to Exhibitech, Inc. Exhibit display apparatus. 236,783, 9–16–75, Cl. D6—168.
Myers, George M. Lavatory. 236,831, 9–16–75, Cl. D23—58.
Nowak, Ralph M., to Tucker Mfg. Corp. Storage cabinet. 236,779, 9–16–75, Cl. D6—127.
Oce-van der Grinten N.V.: *See*—
Lucker, Louis J. H., and Breuers. 236,853.
Lucker, Louis J. H., and Breuers. 236,854.
Oehring, Robert E.: *See*—
Larsen, Harold H., and Oehring. 236,821.
Larsen, Harold H., and Oehring. 236,822.
Old Stone Oven Corp.: *See*—
Bruno, Pasquale N., and Stewart. 236,790.
Bruno, Pasquale N., and Stewart. 236,791.
Osmundson, Kathleen C. Hockey word game board. 236,843, 9–16–75, Cl. D34—5.
Park, John Y. Combined canister and adjustable bookrack. 236,789, 9–16–75, Cl. D7—81.
Paulich, Rudolph, to Columbia Specialty Co., Inc. Door knocker or the like. 236,795, 9–16–75, Cl. D8—177.
Phillips, Robert B., and L. H. Hunt. Combined bed and enclosure. 236,776, 9–16–75, Cl. D6—79.
Podunavac, Bozo. Guitar head. 236,849, 9–16–75, Cl. D56—1.
Polli, Henry J. Aquarium. 236,839, 9–16–75, Cl. D30—8.
Quinn, Peter T., to Honeywell Inc. Photographic camera. 236,851, 9–16–75, Cl. D61—1.
RCA Corp.: *See*—
Abrahamsen, Thomas C., and Zaccai. 236,780.
R & D Supplies, Inc.: *See*—
Berry, William J., Jr., and W. J. III. 236,829.
Reh, Carter K., and C. E. Funkhouser III, to United Visuals Corp. Film cartridge. 236,852, 9–16–75, Cl. D61—1.
Rhodes, M. H., Inc.: *See*—
Draghi, James A. 236,812.
Rose, Vincent H.: *See*—
Lowery, Dennis J., and Rose. 236,813.
SEB: *See*—
Marrie, Paul A. 236,848.
Samsonite Corp.: *See*—
Smith, Dale D. 236,785.
Smith, Dale D. 236,786.

Sanderford, M. Vinvent, and P. J. Davis, to Champion International Corp. Modular hinges. 236,797, 9–16–75, Cl. D8—195.
Sanders, Raymond H.: *See*—
Thiere, Arthur A., and Sanders. 236,778.
Santos, Virgil M. Game board. 236,841, 9–16–75, Cl. D34—5.
Sato, Stephens N., to IVAC Corp. Electronic thermometer. 236,814, 9–16–75, Cl. D10—57.
Schlueter Mfg. Co.: *See*—
Deuschle, Fritz. 236,796.
Schmit, Justin M., to Arctic Pac, Inc. Dispensing pouch for liquids. 236,807, 9–16–75, Cl. D9—194.
Schneider, David: *See*—
Davis, Paul, Schneider, and Hollinger. 236,805.
Shakespeare Co.: *See*—
McLain, Philippe H. T. 236,808.
Sharp Kabushiki Kaisha: *See*—
Miyake, Takao. 236,792.
Shiseido Co., Ltd.: *See*—
Kumai, Yasui. 236,806.
Siemens Aktiengesellschaft: *See*—
Kramer, Herbert, and Kao. 236,835.
Silva, Richard. Clock. 236,809, 9–16–75, Cl. D10—6.
Sklaroff, William B., to Tiffany Industries, Inc. Cabinet. 236,782, 9–16–75, Cl. D6—165.
Smith, Arthur L. Identification label. 236,826, 9–16–75, Cl. D19—13.
Smith, Dale D., to Samsonite Corp. Table. 236,785, 9–16–75, Cl. D6—177.
Smith, Dale D., to Samsonite Corp. Table. 236,786, 9–16–75, Cl. D6—177.
Speer, Gregory B., to Blazon-Flexible Flyer, Inc. Child's swing seat. 236,766, 9–16–75, Cl. D6—10.
Standun, Inc.: *See*—
Thiere, Arthur A., Sanders, and Johnson. 236,778.
Stauble, Alfred G. Milk crate. 236,804, 9–16–75, Cl. D9—177.
Stenemann, Heinrich F., to Minnesota Mining & Mfg. Co. Retroreflective marker for attachment to surfaces adjacent roadways. 236,818, 9–16–75, Cl. D10—111.
Stewart, James L.: *See*—
Bruno, Pasquale N., and Stewart. 236,790.
Bruno, Pasquale N., and Stewart. 236,791.
Stirling, Loren D., to Xerox Corp. Bookcase or similar article. 236,787, 9–16–75, Cl. D6—184.
Sweetheart Plastics, Inc.: *See*—
Davis, Paul, Schneider, and Hollinger. 236,805.
Switzer, Ralph V. Combined wheel chocks and flag. 236,823, 9–16–75, Cl. D12—217.
Telesonic Systems Inc.: *See*—
Palente, Anthony S. 236,838.
Thiere, Arthur A., R. H. Sanders, and G. E. Johnson, to Standun, Inc. Combined bag storage and filling rack. 236,778, 9–16–75, Cl. D6—85.
Tiffany Industries, Inc.: *See*—
Sklaroff, William B. 236,782.
Tucker Mfg. Corp.: *See*—
Nowak, Ralph M. 236,779.
Tufvesson, Kent, to ABU AB. Casting reel for sea-fishing. 236,827, 9–16–75, Cl. D22—25.
United Visuals Corp.: *See*—
Reh, Carter K., and Funkhouser. 236,852.
Valente, Anthony S., to Telesonic Systems Inc. Receiver chassis for tour guide systems. 236,838, 9–16–75, Cl. D26—14.
Velolind Inc.: *See*—
D'Addario, Theodore A., and Estes. 236,794.
Waring, Donald A., to Ethyl Development Corp. Bottle or similar article. 236,801, 9–16–75, Cl. D9—137.
Warnberg, Archie E. Throw rug. 236,788, 9–16–75, Cl. D6—212.
Watkins, Donald E.: *See*—
Bochmann, Carl E., and Watkins. 236,830.
Wilson, Kirk Z. Gymnastic exercise apparatus. 236,842, 9–16–75, Cl. D34—5.
Xerox Corp.: *See*—
Knodt, Ruediger W. 236,850.
Stirling, Loren D. 236,787.
Zaccai, John D.: *See*—
Abrahamsen, Thomas C., and Zaccai. 236,780.

338

1.9

2
10
28
134
252R

17
81
85
97
337

10.2
30
128R
140
149.3
151.1
156

9

4

48.5
145
163

42

156

230B

230R
253R
254E
259
281
283
288FC

67.5
73HR
81CR
204
205.11
205.16

1R
1.4
71.3
72.17

25.13
25.17
76R
96
149.5S
157.1R
183.5

191
194
196.2
267
418
428

433
434
455
460
526
577
598
605
620

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER16, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
338 3,905,046

CLASS 3
1.9 3,905,047

CLASS 4
2 3,905,048
10 3,905,049
28 3,905,050
134 3,905,051
252R 3,905,052

CLASS 5
17 3,905,053
81 3,905,054
85 3,905,055
97 3,905,056
337 3,905,057
3,905,058

CLASS 8
10.2 3,905,761
30 3,905,762
128R 3,905,763
140 3,905,764
149.3 3,905,765
151.1 3,905,059
156 3,905,766

CLASS 9
9 3,905,060

CLASS 15
4 3,905,061

CLASS 16
3,905,062
48.5 3,905,063
145 3,905,064
163 3,905,065

CLASS 17
42 3,905,066

CLASS 19
156 3,905,067

CLASS 23
230B 3,905,767
3,905,769
230R 3,905,768
253R 3,905,770
254E 3,905,771
259 3,905,772
281 3,905,773
283 3,905,774
288FC 3,905,775

CLASS 24
67.5 3,905,068
73HR 3,905,069
81CR 3,905,070
204 3,905,071
205.11R 3,905,073
205.16R 3,905,072

CLASS 28
1R 3,905,074
1.4 3,905,075
71.3 3,905,076
72.17 3,905,077

CLASS 29
25.13 3,905,078
25.17 3,905,079
76R 3,905,080
96 3,905,081
149.5S 3,905,083
157.1R 3,905,082
183.5 3,905,776
3,905,777
191 3,905,778
194 3,905,779
196.2 3,905,780
267 3,905,084
418 3,905,085
428 3,905,086
3,905,087
433 3,905,088
434 3,905,089
455 3,905,090
460 3,905,091
526 3,905,093
577 3,905,094
598 3,905,095
605 3,905,096
620 3,905,097
628 3,905,098

CLASS 30
41.5 3,905,099
124 3,905,100
162 3,905,101
194 3,905,102
276 3,905,103
384 3,905,104
393 3,905,105

CLASS 32
2 3,905,106
10A 3,905,107
3,905,108
3,905,109
14A 3,905,111
15 3,905,110
32 3,905,112
40R 3,905,113

CLASS 33
138 3,905,114
143L 3,905,115
174B 3,905,117
174L 3,905,116
179.5R 3,905,119
202 3,905,118
203.14 3,905,120
361 3,905,121

CLASS 34
17 3,905,122
31 3,905,123
33 3,905,124
72 3,905,126
151 3,905,125
182 3,905,127

CLASS 35
8A 3,905,128
13 3,905,129
3,905,131
17 3,905,130
22R 3,905,132
27 3,905,133
49 3,905,134

CLASS 36
2.5R 3,905,135

CLASS 37
8 3,905,136
56 3,905,137

CLASS 38
97 3,905,138

CLASS 40
33 Re.28,549
64R 3,905,139
106.25 3,905,140
125F 3,905,141

CLASS 42
18 3,905,142

CLASS 43
7 3,905,143
17.1 3,905,147
42.74 3,905,144
43.12 3,905,148
44.2 3,905,149
53.5 3,905,145
137 3,905,146

CLASS 44
71 3,905,781
78 3,905,782

CLASS 46
25 3,905,150
174 3,905,151

CLASS 47
57.6 3,905,152
58 3,905,153

CLASS 49
485 3,905,154

CLASS 51
8R 3,905,155
46 3,905,156
89 3,905,158
92BS 3,905,157
95LH 3,905,159
106R 3,905,160
165.77 3,905,161
281SF 3,905,162
284 3,905,163

CLASS 52
30 3,905,164
58 3,905,165
65 3,905,166
79 3,905,167
116 3,905,168
137 3,905,169
593 3,905,170
615 3,905,171
741 3,905,172
758B 3,905,173

CLASS 53
38 3,905,174
76 3,905,175
212 3,905,176
314 3,905,177
328 3,905,178

CLASS 54
47 3,905,179

CLASS 55
31 3,905,783
3,905,784
96 3,905,785
230 3,905,786
488 3,905,787
489 3,905,788

CLASS 56
7 3,905,180
13.1 3,905,181
13.6 3,905,182
327A 3,905,183

CLASS 57
34R 3,905,186
3,905,187
52 3,905,184
106 3,905,185

CLASS 58
23R 3,905,188
56 3,905,189

CLASS 59
93 3,905,190

CLASS 60
39.07 3,905,191
39.71 3,905,192
290 3,905,193
449 3,905,194
512 3,905,195
641 3,905,196
646 3,905,197
669 3,905,198

CLASS 61
46 3,905,199
72.6 3,905,200

CLASS 62
13 3,905,201
152 3,905,202
272 3,905,203
296 3,905,204
299 3,905,789
309 3,905,205
373 3,905,206

CLASS 64
10 3,905,207
11R 3,905,208
15R 3,905,209

CLASS 65
2 3,905,790
18 3,905,792
30 3,905,791
106 3,905,794
163 3,905,793
279 3,905,795

CLASS 66
125R 3,905,210
157 3,905,211
185 3,905,212

CLASS 70
58 3,905,214
368 3,905,213

CLASS 71
21 3,905,796
87 3,905,799
92 3,905,800
93 3,905,801

CLASS 72
13 3,905,216
66 3,905,797
76 3,905,798
132 3,905,217
148 3,905,218
450 3,905,219
475 3,905,220

CLASS 73
8 3,905,221
19 3,905,222
65 3,905,223
71.3 3,905,224
117 3,905,225
151 3,905,227
155 3,905,226
190H 3,905,228
194E 3,905,229
204 3,905,230
267 3,905,231
295 3,905,243
304R 3,905,236
362AR 3,905,232
382 3,905,215
393 3,905,237
425.6 3,905,238
432SD 3,905,234
3,905,240
432R 3,905,233
3,905,239
505 3,905,235

CLASS 74
5.6A 3,905,244
7C 3,905,245
18.2 3,905,246
82 3,905,247
243R 3,905,248
470 3,905,241
480R 3,905,242
543 3,905,249
665B 3,905,250
687 3,905,251
759 3,905,252
803 3,905,253

CLASS 75
10C 3,905,803
11 3,905,804
25 3,905,805
35 3,905,806
85 3,905,807
101R 3,905,808
120 3,905,802
134S 3,905,809
154 3,905,810

CLASS 81
57.3 3,905,254
119 3,905,255
165 3,905,256

CLASS 82
36A 3,905,257

CLASS 83
11 3,905,261
13 3,905,258
77 3,905,259
155 3,905,260
425.2 3,905,262
477.2 3,905,263
481 3,905,264
537 3,905,265
819 3,905,266

CLASS 84
115 3,905,267
383 3,905,268
470 3,905,269

CLASS 85
5R 3,905,270
32V 3,905,271

CLASS 89
1R 3,905,272

CLASS 90
11R 3,905,273

CLASS 91
6.5 3,905,274
375R 3,905,275
398 3,905,276
400 3,905,277

CLASS 92
10 3,905,278
13.8 3,905,279
143 3,905,281

CLASS 93
36M 3,905,282
44.1R 3,905,280
58.2R 3,905,283

CLASS 96
1.01Y 3,905,811
1.3 3,905,812
1.5 3,905,813
3,905,814
33 3,905,816
35.1 3,905,819
36 3,905,817
36.2 3,905,818
68 3,905,815
86P 3,905,820
107 3,905,821
116 3,905,822

CLASS 98
110 3,905,284

CLASS 99
353 3,905,285
450 3,905,286
571 3,905,287

CLASS 100
162R 3,905,288
215 3,905,289
3,905,290

CLASS 101
40 3,905,292
56 3,905,293
93.48 3,905,294
331 3,905,295
348 3,905,296

CLASS 102
39 3,905,291
66 3,905,297
70.2P 3,905,298
93 3,905,299

CLASS 104
1R 3,905,300
99 3,905,301
130 3,905,302
3,905,303
172C 3,905,304

CLASS 105
197D 3,905,305
215C 3,905,306
221K 3,905,307
238R 3,905,308
372 3,905,309

CLASS 106
38.22 3,905,823
39.6 3,905,824
62 3,905,845
308N 3,905,825
315 3,905,826

CLASS 108
111 3,905,310
136 3,905,311

CLASS 110
8R 3,905,312

CLASS 111
1 3,905,313

CLASS 112
83 3,905,314
86 3,905,315
153 3,905,316

CLASS 113
114R 3,905,317
119 3,905,318

CLASS 114
.5D 3,905,319
23 3,905,320
103 3,905,321
218 Re.28,550
3,905,322

CLASS 115
1R 3,905,323

CLASS 116
63P 3,905,324

CLASS 118
7 3,905,325
24 3,905,326
50 3,905,327
74 3,905,328
602 3,905,329
629 3,905,330
637 3,905,331
3,905,332

CLASS 119
17 3,905,333
20 3,905,334

CLASS 122
4D 3,905,336

CLASS 123
8.09 3,905,337
43A 3,905,338
46R 3,905,339
73AA 3,905,342
73A 3,905,340
73R 3,905,341
75B 3,905,343
75C 3,905,344
119F 3,905,345
3,905,346
148E 3,905,347
198D 3,905,348

CLASS 124
11R 3,905,349
17 3,905,350

CLASS 126
121 3,905,351
270 3,905,352

CLASS 128
2.05G 3,905,353
2.05M 3,905,354
2.06R 3,905,364
2.1M 3,905,355
25 3,905,356
66 3,905,358
75 3,905,359
130 3,905,360
140N 3,905,335
145.5 3,905,361
145.8 3,905,362
3,905,363
218C 3,905,365
3,905,366
232 3,905,370
253 3,905,371
254 3,905,367
272 3,905,368
285 3,905,372
287 3,905,369
303.14 3,905,373
317 3,905,374
329A 3,905,375
595 3,905,376

CLASS 131
9 3,905,377

CLASS 132
5 3,905,378
9 3,905,379
40 3,905,380

CLASS 134
13 3,905,827
122 3,905,381

CLASS 136
6R 3,905,828
26 3,905,829
31 3,905,830
86D 3,905,831
86R 3,905,832
107 3,905,833
3,905,834
111 3,905,835
131 3,905,851

CLASS 137
102 3,905,382
110 3,905,383
111 3,905,384
187 3,905,385
215 3,905,386
223 3,905,387

318 3,905,388
375 3,905,389
518 3,905,390
525.3 3,905,391
557 3,905,392
596.14 3,905,393
599 3,905,394
604 3,905,395

CLASS 138

26 3,905,357
97 3,905,396
118.1 3,905,397
124 3,905,398
129 3,905,399
140 3,905,400

CLASS 139

11 3,905,401
127P 3,905,402

CLASS 140

71R 3,905,403

CLASS 141

46 3,905,404
3,905,405
390 3,905,406

CLASS 144

3D 3,905,407
178 3,905,408

CLASS 145

33E 3,905,409

CLASS 148

1.5 3,905,836
6.14R 3,905,837
6.27 3,905,838
31.57 3,905,839
3,905,840
32 Re.28,552
105 3,905,841
111 3,905,842
3,905,843
177 3,905,844

CLASS 149

19.4 3,905,846

CLASS 150

1 3,905,410

CLASS 151

21R 3,905,411

CLASS 152

340 3,905,412

CLASS 156

62.2 3,905,847
63 3,905,848
79 3,905,849
91 3,905,850
180 3,905,852
187 3,905,853
212 3,905,854
323 3,905,855
425 3,905,856
435 3,905,857
436 3,905,858
443 3,905,859
459 3,905,860
499 3,905,861
580 3,905,862

CLASS 157

1.24 3,905,413

CLASS 160

330 3,905,414

CLASS 162

113 3,905,863
133 3,905,864

CLASS 164

72 3,905,415
132 3,905,416
147 3,905,417
260 3,905,418
337 3,905,419

CLASS 165

82 3,905,420

CLASS 166

51 3,905,421
245 3,905,422
296 3,905,423

CLASS 169

46 3,905,424

CLASS 172

321 3,905,425

CLASS 173

1 3,905,426
12 3,905,427
128 3,905,428
163 3,905,429

CLASS 174

42 3,906,143
52S 3,906,144
61 3,906,145
72A 3,906,146
84R 3,906,147
3,906,148
167 3,906,149

CLASS 175

53 3,905,430
3,905,431
335 3,905,432

CLASS 177

184 3,905,433
208 3,905,434

CLASS 178

3 3,906,151
6.7A 3,906,152
7.3R 3,906,150
58A 3,906,153
69.5TV 3,906,155
69.5R 3,906,154

CLASS 179

1AT 3,906,157
1GQ 3,906,156
1N 3,906,158
15AQ 3,906,159
3,906,161
15BT 3,906,160
16F 3,906,162
18EA 3,906,164
18ES 3,906,163
18GE 3,906,175
18F 3,906,165
41A 3,906,166
81R 3,906,167
84L 3,906,168
100.1A 3,906,169
107R 3,906,170
115.5VC 3,906,171
170.6 3,906,172
175.3R 3,906,173
3,906,174

CLASS 180

1AP 3,905,435
6.5 3,905,436
15 3,905,437
33D 3,905,442
79.2R 3,905,438
3,905,439
82C 3,905,440
98 3,905,441

CLASS 181

33G 3,905,443
33K 3,905,444
46 3,905,445
114 3,905,446
143 3,905,447
172 3,905,448

CLASS 182

82 3,905,449

CLASS 184

6.14 3,905,450
7D 3,905,451

CLASS 187

1R 3,905,452
17 3,905,453

CLASS 188

1C 3,905,454
73.3 3,905,455
79.5P 3,905,456

CLASS 192

5 3,905,457
26 3,905,458
109F 3,905,459

CLASS 194

1B 3,905,460
4C 3,905,461

CLASS 195

1.1 3,905,865
28R 3,905,866
3,905,867
36P 3,905,868
62 3,905,869
3,905,870
63 3,905,871
103.5R 3,905,872

CLASS 197

1R 3,905,462
3,905,463
170 3,905,464
181 3,905,465

CLASS 198

25 3,905,466
30 3,905,467
34 3,905,468
38 3,905,469
127R 3,905,470
161 3,905,471
203 3,905,472
208 3,905,473

CLASS 200

42T 3,906,176
61.86 3,906,177
3,906,178
68 3,906,179
148A 3,906,180
164R Re.28,555

CLASS 202

160 3,905,873

CLASS 203

1 3,905,874
71 3,905,875

CLASS 204

2 3,905,876
30 3,905,877
43S 3,905,878
92 3,905,879
99 3,905,880
113 3,905,881
119 3,905,882
129 3,905,884
129.43 3,905,885
129.65 3,905,883
180P 3,905,886
192 3,905,887
195M 3,905,889
195P 3,905,888
276 3,905,890
305 3,905,891

CLASS 206

45.33 3,905,474
330 3,905,475
361 3,905,476
459 3,905,477
523 3,905,478
531 3,905,479

CLASS 208

95 3,905,892
210 3,905,893

CLASS 209

17 3,905,894
3,905,895
124 3,905,896
405 3,905,897
444 3,905,898

CLASS 210

14 3,905,899
20 3,905,900
21 3,905,901
30 3,905,902
31C 3,905,903
195 3,905,904
436 3,905,905

CLASS 211

45 3,905,480
60SK 3,905,481
74 3,905,482
177 3,905,483
184 3,905,484

CLASS 214

1D 3,905,485
1H 3,905,486
6DK 3,905,488
6DS Re.28,551
6A 3,905,489
6D 3,905,490
6H 3,905,487
11R 3,905,491
16.4B 3,905,492
75T 3,905,493
89 3,905,494
91R 3,905,495
128 3,905,496
302 3,905,497
317 3,905,498
450 3,905,499
762 3,905,500
3,905,501

CLASS 215

250 3,905,502
255 3,905,503
316 3,905,504

CLASS 219

10.49 3,906,181
51 3,906,182
3,906,183
131F 3,906,184
211 3,906,185
242 3,906,186
254 3,906,187
275 3,906,188

CLASS 220

15 3,905,508
22 3,905,505
23.8 3,905,506
66 3,905,507
83 3,905,510
90.2 3,905,511
90.4 3,905,512
268 3,905,513
273 3,905,514
319 3,905,509

CLASS 221

155 3,905,530

CLASS 222

3 3,905,515
63 3,905,516
95 3,905,517
146HE 3,905,518
166 3,905,519
209 3,905,520
309 3,905,521
400.7 3,905,522
504 3,905,523
536 3,905,524

CLASS 224

5C 3,905,525
5V 3,905,526
42.03A 3,905,527
48R 3,905,529

CLASS 225

3 3,905,531
35 3,905,532

CLASS 226

44 3,905,533
184 3,905,534

CLASS 227

120 3,905,535

CLASS 228

17 3,905,536
173 3,905,092
180 3,905,537

CLASS 229

1.5R 3,905,538
4.5 3,905,539
16R 3,905,540
23R 3,905,541
29M 3,905,542
31FS 3,905,543
41B 3,905,544
51TC 3,905,646
69 3,905,545

CLASS 233

10 3,905,546
26 3,905,528

CLASS 235

61.11C 3,906,191
61.11E 3,906,202
3,906,203
61.12R 3,906,192
61.5S 3,906,189
61.6A 3,906,190
61.7B 3,906,201
89R 3,906,193
90 3,905,547
92LG 3,906,195
92MP 3,906,194
144ME 3,906,206
150.1 3,906,196
150.2 3,906,207
150.21 3,906,205
150.27 3,906,204
151 3,906,197
151.33 3,906,208
151.35 3,906,198
152 3,906,199
153AK 3,906,200
153AM 3,906,209
156 3,906,218
158 3,906,210
175 3,906,211
176 3,906,212
181 3,906,213
183 3,906,214

CLASS 237

69 3,905,548

CLASS 238

369 3,905,549

CLASS 239

15 3,905,550
63 3,905,551
101 3,905,552
124 3,905,553
424 3,905,554
573 3,905,555

CLASS 240

6.4W 3,906,216
10R 3,906,215
51.11 3,906,217

CLASS 241

24 3,905,556
30 3,905,557
55 3,905,558
59 3,905,559

CLASS 242

18DD 3,905,560
71.8 3,905,561
107.4 3,905,562

CLASS 244

3.15 3,905,563
17.11 3,905,564
17.23 3,905,565
53B 3,905,566
115 3,905,567

CLASS 246

430 3,905,568

CLASS 248

16 3,905,569
71 3,905,570
102 3,905,571
242 3,905,572
445 3,905,573

CLASS 249

45 3,905,574

CLASS 250

204 3,906,219
227 3,906,220
3,906,221
229 3,906,222
231SE 3,906,223
264 3,906,224
272 3,906,225
304 3,906,226
315 3,906,228
320 3,906,227
336 3,906,229
3,906,230
338 3,906,231
341 3,906,232
355 3,906,233
366 3,906,234
404 3,906,235
455 3,906,236
489 3,906,237
536 3,905,920
548 3,906,238
562 3,906,239
571 3,906,240
574 3,906,241

CLASS 251

30 3,905,575
77 3,905,689
327 3,905,576
357 3,905,577

CLASS 252

49.9 3,905,908
156 3,905,909
175 Re.28,553
259.5 3,905,910
301.4P 3,905,911
3,905,912
429A 3,905,913
3,905,915
437 3,905,914
453 3,905,916
455R 3,905,917
462 3,905,918
522 3,905,919

CLASS 254

75 3,905,578
105 3,905,579
172 3,905,580
193 3,905,581

CLASS 259

4 3,905,582
8 3,905,583
72 3,905,584
111 3,905,585
154 3,905,586
158 3,905,587
191 3,905,588

CLASS 260

2.5AD 3,905,923
2.5AH 3,905,924
2.5AJ 3,905,922
2.5BD 3,905,925
2.5F 3,905,921
17.5 3,905,926
23XA 3,905,927
29.2TN 3,905,929
29.2E 3,905,928
29.6MN 3,905,930
29.6NR 3,905,931
29.7M 3,905,932
31.6 3,905,933
31.8T 3,905,934
33.2R 3,905,935
40R 3,905,936
3,905,937
3,905,938
45.8N 3,905,939
47CP 3,905,942
47UA 3,905,941
75NH 3,905,944
75UA 3,905,943
77.5R 3,905,945
78L 3,905,946
79.5R 3,905,947
82 3,905,948
143 3,905,949
153 3,905,950
156 3,905,951
186 3,905,952
211.5R 3,905,953
212 3,905,954
239D 3,905,957
3,905,977
239R 3,905,958
239.1 3,905,955
3,905,959
3,905,960
3,905,961
239.3D 3,906,003
239.3T 3,905,956
239.55D 3,905,962
240B 3,905,964
243C 3,905,963
3,905,966
3,905,967
243R 3,905,965
247 3,905,968
247.2B 3,905,969
3,905,970
247.5C 3,905,971
247.5R 3,905,972
248AS 3,905,973
250AC 3,905,974
251R 3,905,975
256.4F 3,905,976
268BC 3,905,980
268BF 3,905,979
268PH 3,905,978
285 3,905,981
287R 3,905,982
294.8F 3,905,985
294.8G 3,905,983
294.8H 3,905,984
296D 3,905,986
296R 3,905,987
307B 3,905,988
308D 3,905,989
309.2 3,905,990
3,905,991
309.6 3,905,992
3,905,993
3,905,994
309.7 3,905,995
3,905,996
310A 3,905,997
315 3,905,998
319.1 3,905,999
326C 3,906,002
326.5B 3,906,000
327R 3,906,001
340.3 3,906,004
340.5 3,906,006
345.2 3,906,005
346.1R 3,906,009
346.2M 3,906,007
346.8A 3,906,008
347.5 3,906,010
369 3,906,011
377 3,906,012
383 3,906,013
397.2 3,906,014
410.9R 3,906,015
3,906,016
438.5R 3,906,017
448.2N 3,906,018
453P 3,906,019
455B 3,906,021
455R 3,906,020
456A 3,906,022
463 3,906,023
464 3,905,940
465E 3,906,024
3,906,025
468E 3,906,027
468H 3,906,026
468R 3,906,028
470 3,906,029
471C 3,906,031
471R 3,906,030
473F 3,906,032
479R 3,906,033
3,906,034
491 3,906,035
497A 3,906,036
505C 3,906,037
507R 3,906,038
558R 3,906,040
558S 3,906,041
559AT 3,906,043
559T 3,906,042
564R 3,906,044
580 3,906,045
584R 3,906,046
586R 3,906,047
609F 3,906,050
609R 3,906,048
3,906,049
648F 3,906,052
653.6 3,906,051
683.15D 3,906,053
683.43 3,906,054
831 3,906,055
876B 3,906,056
3,906,057
3,906,058
878R 3,906,059
897C 3,906,060
928 3,906,061
932 3,906,062
3,906,063

CLASS 264

24 3,906,064
40 3,906,065
45.5 3,906,066
46.5 3,906,067
51 3,906,068

70 3,906,069
147 3,906,073
159 3,906,070
255 3,906,071
322 3,906,072

CLASS 266

35 3,905,589

CLASS 267

160 3,905,590

CLASS 269

328 3,905,591

CLASS 270

61R 3,905,592
62 3,905,593

CLASS 271

173 3,905,594
217 3,905,595

CLASS 272

29 3,905,596
73 3,905,597
81 3,905,599

CLASS 273

75 3,905,598
96R 3,905,600
131AB 3,905,601
134AE 3,905,602
138R 3,905,603

CLASS 274

10S 3,905,604

CLASS 277

22 3,905,605
27 3,905,606
92 3,905,607
188 3,905,608

CLASS 279

20 3,905,609

CLASS 280

11.35B 3,905,612
11.35C 3,905,906
11.35R 3,905,613
11.35T 3,905,611
11.37A 3,905,610
150AB 3,905,615
150SB 3,905,614
154.5R 3,905,616
206 3,905,617
278 3,905,618
415A 3,905,619
419 3,905,620

CLASS 285

7 3,905,621
338 3,905,622
382 3,905,623

CLASS 290

1 3,906,250

CLASS 292

11 3,905,624
128 3,905,625
216 3,905,626
3,905,627
257 3,905,628

CLASS 293

24 3,905,629
98 3,905,630

CLASS 294

65.5 3,905,631
67R 3,905,632
82R 3,905,633
86A 3,905,634
88 3,905,635
95 3,905,636

CLASS 296

1C 3,905,637
26 3,905,638
37R 3,905,639
137F 3,905,640
3,905,641

CLASS 297

185 3,905,642
195 3,905,643

CLASS 298

22AE 3,905,644

CLASS 299

31 3,905,645
70 3,905,647

CLASS 301

5B 3,905,648
5.7 3,905,649

CLASS 302

53 3,905,650

CLASS 303

2 3,905,651
21EB 3,905,652
21F 3,905,653
3,905,654
3,905,655
50 3,905,656

CLASS 307

38 3,906,242
45 3,906,251
66 3,906,243
106 3,906,252
115 3,906,244
117 3,906,253
205 3,906,254
3,906,255
225R 3,906,245
3,906,256
229 3,906,246
231 3,906,257
232 3,906,258
235R 3,906,259
293 3,906,247
3,906,248

CLASS 308

36.1 3,905,658
3,905,659
73 3,905,657
191 3,905,660
207A 3,905,661

CLASS 310

9.1 3,906,249
9.6 3,906,260
12 3,906,261
3,906,262
29 3,906,263
51 3,906,264
55 3,906,265
60R 3,906,266
68R 3,906,267
154 3,906,268

CLASS 312

250 3,905,662
253 3,905,663

CLASS 313

157 3,906,270
213 3,906,271
214 3,906,272
220 3,906,273
228 3,906,274
318 3,906,275
337 3,906,276
365 3,906,277
383 3,906,278
409 3,906,279
449 3,906,280
481 3,906,281
3,906,282
483 3,906,283
490 3,906,284
496 3,906,269
3,906,285
3,906,286
519 3,906,287

CLASS 315

5.42 3,906,300
13C 3,906,288
97 3,906,301
111 3,906,289
169R 3,906,290
171 3,906,291
208 3,906,292
209 3,906,302
370 3,906,303
379 3,906,304
399 3,906,305
408 3,906,306
3,906,307

CLASS 317

2E 3,906,308
18R 3,906,293
3,906,309
33SC 3,906,298
33VR 3,906,310
107 3,906,295
141S 3,906,294
230 3,906,311
258 3,906,297
260 3,906,312

CLASS 318

7 3,906,299
85 3,906,313
138 3,906,314
212 3,906,315
221D 3,906,316
246 3,906,317
269 3,906,318
318 3,906,319
331 3,906,320
439 3,906,321
464 3,906,322
563 3,906,323
567 3,906,324
569 3,906,325
594 3,906,326
603 3,906,327
612 3,906,328

CLASS 320

44 3,906,329
46 3,906,330

CLASS 321

2 3,906,331
3,906,335
8R 3,906,336
10 3,906,337

CLASS 323

4 3,906,332
17 3,906,333
21 3,906,334
75N 3,906,338

CLASS 324

30B 3,906,354
30R 3,906,353
33 3,906,355
34PS 3,906,339
34D 3,906,356
37 3,906,357
3,906,358
43R 3,906,359
3,906,360
57Q 3,906,340
62 3,906,341
3,906,342
83D 3,906,361
96 3,906,343
113 3,906,362
121R 3,906,344
158F 3,906,363
166 3,906,345
186 3,906,346

CLASS 325

4 3,906,364
37 3,906,348
3,906,366
38B 3,906,367
42 3,906,347
105 3,906,349
111 3,906,369
114 3,906,370
133 3,906,350
352 3,906,371
418 3,906,372
452 3,906,368
459 3,906,351
468 3,906,373

CLASS 328

31 3,906,365
41 3,906,374
71 3,906,375
108 3,906,377
110 3,906,378
112 3,906,379
128 3,906,381
134 3,906,382
163 3,906,383
165 3,906,384

CLASS 329

104 3,906,376
122 3,906,380

CLASS 330

5 3,906,385
22 3,906,386
31 3,906,387
59 3,906,389
107 3,906,390

CLASS 331

39 3,906,388
66 3,906,391
94.5C 3,906,393
3,906,394
94.5D 3,906,396
94.5G 3,906,392
3,906,395
3,906,397
3,906,398
94.5L 3,906,399

CLASS 332

11D 3,906,400
18 3,906,401

CLASS 333

17M 3,906,405
17 3,906,404
18 3,906,406
21A 3,906,407
22F 3,906,402
22R 3,906,403
24.1 3,906,408
29 3,906,409
30R 3,906,410
32 3,906,411
83R 3,906,412

CLASS 335

41 3,906,413
42 3,906,414
47 3,906,415
128 3,906,416
205 3,906,417
210 3,906,418
3,906,419
272 3,906,420

CLASS 336

178 3,906,421

CLASS 337

141 3,906,422
158 3,906,423
394 3,906,424

CLASS 338

20 3,906,425
35 3,906,426
38 3,906,427
143 3,906,428
202 3,906,429
320 3,906,430

CLASS 339

8R 3,905,664
17L 3,905,665
17R 3,905,666
19 3,905,667
60M 3,905,668
65 3,905,669
75MP 3,905,670
95R 3,905,671
103R 3,905,672
192R 3,905,673

CLASS 340

6R 3,906,431
7R 3,906,352
15 3,906,432
15.5MC 3,906,433
18NC 3,906,434
3,906,435
23 3,906,436
27 3,906,437
38R 3,906,438
44 3,906,439
52E 3,906,441
52F 3,906,440
61 3,906,442
69 3,906,443
146.1BA 3,906,445
146.3MA 3,906,446
146.3SY 3,906,444
149A 3,906,447
3,906,448
149R 3,906,449
150 3,906,450
166EL 3,906,451
172.5 3,906,452
3,906,453
3,906,454
3,906,455
3,906,456
3,906,457
3,906,458
3,906,459
3,906,460
3,906,461
173LM 3,906,465
173LS 3,906,462
173R 3,906,463
3,906,464
174PW 3,906,467
174TF 3,906,466
3,906,468
188R 3,906,469
195 3,906,470
200 3,906,471
224 3,906,472
237R 3,906,473
237S 3,906,474
246 3,906,475
253A 3,906,477
253R 3,906,476
279 3,906,478
309.1 3,906,479
324AD 3,906,480
324R 3,906,481
3,906,482
336 3,906,483
347DA 3,906,487
3,906,489
347DD 3,906,484
3,906,485
347NT 3,906,486
347C 3,906,488
388 3,906,490
409 3,906,491

CLASS 343

.5DP 3,906,494
5PD 3,906,492
7PF 3,906,493
7A 3,906,495
9 3,906,496
12A 3,906,497
17.1PF 3,906,498
17.7 3,906,499
3,906,500
100SA 3,906,502
112D 3,906,503
112R 3,906,504
119 3,906,505
702 3,906,506
705 3,906,507
786 3,906,508
895 3,906,509
3,906,514

CLASS 346

1 3,906,510
7 3,906,511
74ES 3,906,501
138 3,906,512
140 3,906,513

CLASS 350

3.5 3,905,674
17 3,905,675
96C 3,905,676
97 3,905,677
3,905,678
103 3,905,679
3,905,680
3,905,681
160LC 3,905,682
161 3,905,683
173 3,905,684
184 3,905,685
189 3,905,686
281 3,905,687

CLASS 351

30 3,905,688

CLASS 352

27 3,905,690
29 3,905,691
52 3,905,692
130 3,905,693

CLASS 353

108 3,905,694
111 3,905,695

CLASS 354

1 3,906,515
27 3,906,516
51 3,906,517
3,906,518
59 3,906,519
62 3,906,520
86 3,906,521
105 3,906,522
109 3,906,523
142 3,906,524
149 3,906,525
3,906,526
152 3,906,527
162 3,906,528
196 3,906,529
206 3,906,530
242 3,906,531
258 3,906,532
272 3,906,533
286 3,906,534
288 3,906,535
319 3,906,536

CLASS 355

10 3,905,696
26 3,905,697
27 3,905,698
41 3,905,699
67 3,905,700
71 3,905,701

CLASS 356

70 3,905,702
106R 3,905,703
152 3,905,704
160 3,905,705
224 3,905,706
249 3,905,707
251 3,905,708

CLASS 357

2 3,906,537
5 3,906,538
7 3,906,296
14 3,906,539
15 3,906,540
22 3,906,541
24 3,906,542
3,906,543
3,906,544
38 3,906,545

CLASS 401

183 3,905,709

CLASS 403

4 3,905,710
16 3,905,711
317 3,905,712
405 3,905,713

CLASS 404

72 3,905,714
84 3,905,715
128 3,905,716

CLASS 408

107 3,905,717
111 3,905,718

CLASS 415

126 3,905,719
148 3,905,720
211 3,905,721

CLASS 416

193 3,905,722
241 3,905,723

CLASS 417

128 3,905,724
231 3,905,725

CLASS 418

56 3,905,726
61B 3,905,727
3,905,728
84 3,905,729
142 3,905,730
195 3,905,731

CLASS 423

40 3,906,074
52 3,906,075
118 3,906,076
149 3,906,077
242 3,906,078
3,906,079
3,906,080
261 3,906,081
446 3,906,082
540 3,906,039
555 3,906,083
629 3,906,084

CLASS 424

9 3,906,085
20 3,906,086
22 3,906,087
33 3,906,088
45 3,906,089
52 3,906,090
70 3,906,091
89 3,906,092
119 3,906,093
200 3,906,094
243 3,906,095
3,906,096
250 3,906,097
251 3,906,098
258 3,906,099
267 3,906,100
272 3,906,101
274 3,906,102
288 3,906,103
303 3,906,104
304 3,906,105
312 3,906,106
315 3,906,107
318 3,906,108
325 3,906,109
330 3,906,110
342 3,906,111

CLASS 425

85 3,905,732
113 3,905,749
224 3,905,733
3,905,734
256 3,905,735
308 3,905,736
363 3,905,737
389 3,905,738
405R 3,905,739
438 3,905,740
450.1 3,905,741
451.2 3,905,742
464 3,905,743
471 3,905,744

CLASS 426

1 3,906,112
64 3,906,113
243 3,906,115
420 3,906,117
479 3,906,118
535 3,906,119
602 3,906,116
641 3,906,114

CLASS 427

4 3,906,120
18 3,906,121
33 3,906,122
145 3,906,123
309 3,906,124
330 3,906,125

CLASS 428

36 3,906,126
73 3,906,127
86 3,906,128
99 3,906,129
131 3,906,130
151 3,906,131
152 3,906,132
172 3,906,133
206 3,906,134
246 3,906,135
262 3,906,136
315 3,906,137
320 3,906,138
334 Re.28,554
383 3,906,139
403 3,906,140
411 3,906,141
498 3,906,142

CLASS 431									CLASS 432				
2	3,905,745	58	3,905,747	183	3,905,751	324	3,905,754	18	3,905,757	144	3,905,759		
35	3,905,746	78	3,905,748		3,905,752	344	3,905,755	128	3,905,758	176	3,905,760		
		142	3,905,750	284	3,905,753	354	3,905,756						

CLASSIFICATION OF DESIGNS

D2—	249	236,802		165	236,781		195	236,797		57	236,814		28	236,828			236,843
D6—	10	236,766			236,782		234	236,798			236,815	D23—	3	236,829		K	236,842
	15	236,767		168	236,783	D9—	2	236,799		85	236,816		18	236,830		15D	236,845
	24	236,768			236,784		111	236,800		106	236,817		58	236,831	D48—	32R	236,846
		236,769		177	236,785		137	236,801		111	236,818	D24—	1D	236,832	D54—	4	236,847
		236,770			236,786		177	236,804	D12—	42	236,819	D26—	R	236,833	D55—	1E	236,848
		236,771		184	236,787		183	236,805		99	236,820		5C	236,834	D56—	A	236,849
		236,772		212	236,788		193	236,806		111	236,803			236,835	D61—	B	236,851
	25	236,773	D7—	81	236,789		194	236,807		158	236,821		14B	236,837		Q	236,850
	27	236,774		123	236,790		216	236,808			236,822		G	236,836		T	236,852
		236,775			236,791	D10—	6	236,809		217	236,823		K	236,838	D64—	11R	236,853
	79	236,776		128	236,792		15	236,810	D13—	1J	236,824	D30—	8	236,839			236,854
	85	236,777		137	236,793		30	236,811			236,825	D32—	1	236,840	D87—	1	236,855
		236,778		187	236,796		40	236,812	D19—	13	236,826	D34—	5DD	236,844			236,856
	127	236,779	D8—	98	236,794		46	236,813	D22—	25	236,827		SS	236,841		3A	236,857
	143	236,780		177	236,795												

CLASSIFICATION OF PLANTS

P. —	68	3,781	P. —	3,783	P. —	3,784	P. —	3,785	P. —	88	3,782

3,905,759
3,905,760

236,843
K 236,842
15D 236,845
32R 236,846
4 236,847
1E 236,848
A 236,849
B 236,851
Q 236,850
T 236,852
11R 236,853
236,854
1 236,855
236,856
3A 236,857

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Utah..... 49
Vermont..... 50
Virginia..... 51
Virgin Islands..... 52
Washington..... 53
West Virginia..... 54
Wisconsin..... 55
Wyoming..... 56
U.S. Air Force..... 57
U.S. Army..... 58
U.S. Navy..... 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,905,170	3,905,429	3,906,174	3,905,910	3,905,097	3,905,449
3,905,324	3,905,435	3,906,184	3,906,185	3,905,130	3,905,453
3,905,558	3,905,436	3,906,194	3,906,219	3,905,132	3,905,469
3,905,628	3,905,445	3,906,198	3,906,474	3,905,169	3,905,477
4 : 3,905,286	3,905,455	3,906,231	9 : 3,905,107	3,905,192	3,905,491
3,905,371	3,905,478	3,906,233	3,905,114	3,905,204	3,905,495
3,905,861	3,905,480	3,906,270	3,905,142	3,905,215	3,905,497
3,905,882	3,905,506	3,906,276	3,905,191	3,905,234	3,905,507
3,906,214	3,905,512	3,906,295	3,905,259	3,905,292	3,905,535
3,906,255	3,905,515	3,906,296	3,905,268	3,905,322	3,905,545
3,906,313	3,905,522	3,906,308	3,905,276	3,905,387	3,905,550
3,906,463	3,905,528	3,906,315	3,905,325	3,905,424	3,905,556
3,906,464	3,905,532	3,906,326	3,905,463	3,905,451	3,905,571
6 : 3,905,047	3,905,541	3,906,334	3,905,464	3,905,632	3,905,593
3,905,098	3,905,543	3,906,346	3,905,465	3,905,711	3,905,607
3,905,103	3,905,549	3,906,347	3,905,597	3,906,109	3,905,616
3,905,110	3,905,564	3,906,371	3,905,642	3,906,133	3,905,621
3,905,112	3,905,566	3,906,374	3,905,800	3,906,244	3,905,626
3,905,139	3,905,573	3,906,376	3,905,801	3,906,362	3,905,633
3,905,146	3,905,577	3,906,385	3,905,832	3,906,494	3,905,661
3,905,147	3,905,580	3,906,388	3,905,868	3,906,514	3,905,677
3,905,148	3,905,587	3,906,392	3,905,872	13 : 3,905,581	3,905,680
3,905,160	3,905,599	3,906,393	3,905,922	3,905,857	3,905,681
3,905,162	3,905,600	3,906,397	3,905,959	3,906,507	3,905,712
3,905,165	3,905,610	3,906,398	3,905,971	16 : 3,905,385	3,905,714
3,905,190	3,905,622	3,906,409	3,906,000	17 : Re.28,551	3,905,715
3,905,195	3,905,629	3,906,428	3,906,050	Re.28,555	3,905,718
3,905,202	3,905,669	3,906,434	3,906,176	3,905,057	3,905,740
3,905,209	3,905,670	3,906,435	3,906,195	3,905,063	3,905,742
3,905,223	3,905,672	3,906,439	3,906,263	3,905,116	3,905,824
3,905,228	3,905,689	3,906,440	3,906,333	3,905,136	3,905,854
3,905,232	3,905,692	3,906,443	3,906,384	3,905,137	3,905,982
3,905,235	3,905,710	3,906,444	3,906,418	3,905,157	3,906,105
3,905,237	3,905,717	3,906,458	3,906,431	3,905,243	3,906,107
3,905,241	3,905,724	3,906,460	3,906,469	3,905,246	3,906,114
3,905,264	3,905,769	3,906,468	3,906,478	3,905,262	3,906,123
3,905,294	3,905,790	3,906,482	10 : Re.28,554	3,905,282	3,906,126
3,905,299	3,905,858	3,906,488	3,905,560	3,905,283	3,906,127
3,905,313	3,905,871	3,906,493	3,905,775	3,905,296	3,906,150
3,905,318	3,905,884	3,906,509	3,905,813	3,905,306	3,906,156
3,905,339	3,905,903	3,906,520	3,905,846	3,905,307	3,906,163
3,905,353	3,905,905	3,906,537	3,905,930	3,905,310	3,906,166
3,905,354	3,905,909	3,906,540	3,905,937	3,905,317	3,906,217
3,905,356	3,905,941	8 : 3,905,196	3,905,952	3,905,348	3,906,247
3,905,360	3,905,979	3,905,508	3,905,973	3,905,350	3,906,257
3,905,368	3,906,020	3,905,513	3,906,015	3,905,379	3,906,316
3,905,374	3,906,038	3,905,540	3,906,073	3,905,397	3,906,345
3,905,378	3,906,055	3,905,727	11 : 3,905,141	3,905,413	3,906,348
3,905,394	3,906,115	3,905,841	3,905,145	3,905,416	3,906,373
3,905,400	3,906,162	3,905,896	12 : Re.28,550	3,905,438	3,906,405
3,905,406	3,906,170	3,905,906	3,905,050	3,905,447	3,906,413

3,906,422
3,906,429
3,906,445
3,906,453
3,906,457
3,906,477
3,906,490
3,906,491
3,906,513
3,906,529
18 : 3,905,089
3,905,100
3,905,111
3,905,404
3,905,408
3,905,425
3,905,487
3,905,750
3,905,767
3,905,926
3,905,953
3,905,963
3,905,966
3,905,987
3,906,028
3,906,085
3,906,179
3,906,304
3,906,311
3,906,351
3,906,412
3,906,512
19 : 3,905,272
3,905,279
3,905,334
3,905,405
3,905,473
3,905,486
3,905,523
3,905,527
3,905,663
3,905,768
3,906,375
20 : 3,905,155
3,905,194
3,905,207
3,905,530
3,905,619
3,905,634
3,905,639
3,905,949
3,906,253
3,906,301
3,906,369
3,906,420
3,906,437
21 : 3,905,154
22 : 3,905,104
3,905,120
3,905,421
3,905,471
3,905,578
3,905,916
3,906,053
24 : 3,905,071
3,905,088
3,905,129
3,905,178
3,905,552
3,905,554
3,905,565
3,905,603
3,905,778
3,905,877
3,906,021
3,906,076
3,906,125
3,906,189
3,906,226
3,906,266
3,906,359
3,906,380
3,906,447
3,906,456
3,906,480
3,906,498
25 : 3,905,085
3,905,199
3,905,203
3,905,233
3,905,265
3,905,308
3,905,361
3,905,362
3,905,363
3,905,370
3,905,384
3,905,392
3,905,409
3,905,484
3,905,516
3,905,521
3,905,531
3,905,602
3,905,625
3,905,675

3,905,690
3,905,723
3,905,754
3,905,795
3,905,802
3,905,817
3,905,831
3,905,887
3,906,031
3,906,052
3,906,064
3,906,111
3,906,132
3,906,229
3,906,232
3,906,248
3,906,271
3,906,298
3,906,309
3,906,350
3,906,379
3,906,400
3,906,415
3,906,461
3,906,462
3,906,483
3,906,486
3,906,527
3,906,528
26 : 3,905,052
3,905,093
3,905,134
3,905,159
3,905,171
3,905,181
3,905,244
3,905,267
3,905,274
3,905,280
3,905,287
3,905,346
3,905,403
3,905,466
3,905,511
3,905,623
3,905,624
3,905,630
3,905,654
3,905,662
3,905,668
3,905,678
3,905,721
3,905,748
3,905,756
3,905,823
3,905,829
3,905,897
3,906,019
3,906,071
3,906,100
3,906,146
3,906,177
3,906,178
3,906,188
3,906,240
3,906,321
3,906,341
3,906,441
3,906,442
27 : 3,905,080
3,905,151
3,905,152
3,905,285
3,905,352
3,905,534
3,905,548
3,905,567
3,905,659
3,905,725
3,905,726
3,905,728
3,905,755
3,905,815
3,905,859
3,905,904
3,905,923
3,906,024
3,906,138
3,906,141
3,906,200
3,906,221
3,906,338
3,906,451
3,906,459
3,906,466
3,906,467
28 : 3,905,321
3,906,230
3,906,365
29 : 3,905,143
3,905,263
3,905,333
3,905,357
3,905,544
3,905,787
3,905,794

3,905,895
3,906,022
3,906,062
3,906,068
3,906,104
31 : 3,905,309
3,905,856
3,906,297
32 : 3,905,213
3,905,251
33 : 3,905,290
34 : Re.28,552
3,905,090
3,905,126
3,905,144
3,905,156
3,905,174
3,905,220
3,905,291
3,905,326
3,905,336
3,905,369
3,905,442
3,905,452
3,905,479
3,905,509
3,905,518
3,905,585
3,905,598
3,905,667
3,905,682
3,905,683
3,905,691
3,905,699
3,905,738
3,905,757
3,905,808
3,905,809
3,905,827
3,905,892
3,905,914
3,905,919
3,905,927
3,905,955
3,905,956
3,905,960
3,905,974
3,905,976
3,905,977
3,905,992
3,905,994
3,905,997
3,906,001
3,906,004
3,906,005
3,906,006
3,906,032
3,906,047
3,906,054
3,906,072
3,906,090
3,906,099
3,906,103
3,906,108
3,906,119
3,906,148
3,906,168
3,906,175
3,906,199
3,906,211
3,906,236
3,906,258
3,906,277
3,906,319
3,906,331
3,906,336
3,906,399
3,906,401
3,906,403
3,906,404
3,906,408
3,906,472
3,906,496
3,906,536
3,906,542
3,906,543
35 : 3,906,499
3,906,500
36 : 3,905,051
3,905,053
3,905,087
3,905,091
3,905,101
3,905,108
3,905,138
3,905,140
3,905,163
3,905,167
3,905,177
3,905,182
3,905,193
3,905,201
3,905,216
3,905,242
3,905,245
3,905,254

3,905,256
3,905,273
3,905,277
3,905,297
3,905,305
3,905,343
3,905,349
3,905,351
3,905,355
3,905,367
3,905,372
3,905,380
3,905,396
3,905,411
3,905,418
3,905,460
3,905,519
3,905,539
3,905,613
3,905,660
3,905,685
3,905,686
3,905,695
3,905,713
3,905,739
3,905,743
3,905,772
3,905,781
3,905,788
3,905,812
3,905,822
3,905,839
3,905,840
3,905,842
3,905,843
3,905,848
3,905,899
3,905,908
3,905,924
3,905,938
3,905,939
3,905,942
3,905,958
3,905,975
3,905,998
3,906,002
3,906,010
3,906,018
3,906,045
3,906,087
3,906,093
3,906,097
3,906,110
3,906,121
3,906,135
3,906,136
3,906,158
3,906,173
3,906,215
3,906,223
3,906,227
3,906,243
3,906,252
3,906,254
3,906,259
3,906,265
3,906,268
3,906,273
3,906,274
3,906,282
3,906,293
3,906,368
3,906,410
3,906,411
3,906,426
3,906,473
3,906,475
3,906,485
3,906,502
3,906,505
3,906,516
3,906,538
3,906,541
3,906,544
37 : 3,905,076
3,905,077
3,905,131
3,905,212
3,905,225
3,905,375
3,905,376
3,905,793
3,905,928
3,906,153
3,906,370
3,906,454
3,906,484
39 : 3,905,078
3,905,086
3,905,109
3,905,113
3,905,117
3,905,123
3,905,173
3,905,221
3,905,231

3,905,289
3,905,293
3,905,323
3,905,335
3,905,373
3,905,398
3,905,444
3,905,457
3,905,458
3,905,467
3,905,503
3,905,514
3,905,529
3,905,588
3,905,638
3,905,648
3,905,705
3,905,716
3,905,735
3,905,751
3,905,752
3,905,776
3,905,780
3,905,789
3,905,806
3,905,830
3,905,833
3,905,851
3,905,855
3,905,863
3,905,934
3,905,944
3,905,947
3,906,007
3,906,057
3,906,058
3,906,067
3,906,117
3,906,145
3,906,147
3,906,196
3,906,202
3,906,203
3,906,208
3,906,272
3,906,342
3,906,396
3,906,402
3,906,424
3,906,503
40 : 3,905,153
3,905,227
3,905,255
3,905,423
3,905,510
3,905,604
3,905,637
3,905,782
3,905,874
3,905,891
3,905,898
3,906,009
3,906,042
3,906,051
3,906,077
41 : 3,905,056
3,905,118
3,905,166
3,905,269
3,905,329
3,905,706
3,905,847
3,905,850
3,905,921
3,906,112
3,906,344
3,906,363
3,906,416
42 : 3,905,054
3,905,055
3,905,197
3,905,236
3,905,295
3,905,312
3,905,340
3,905,341
3,905,342
3,905,386
3,905,390
3,905,430
3,905,454
3,905,475
3,905,476
3,905,483
3,905,485
3,905,489
3,905,493
3,905,537
3,905,575
3,905,589
3,905,609
3,905,615
3,905,635
3,905,665
3,905,673
3,905,744

3,905,747
3,905,799
3,905,804
3,905,805
3,905,816
3,905,865
3,905,885
3,905,893
3,905,902
3,905,912
3,905,935
3,905,943
3,905,967
3,905,981
3,905,991
3,906,049
3,906,080
3,906,092
3,906,120
3,906,124
3,906,172
3,906,186
3,906,187
3,906,239
3,906,328
3,906,349
3,906,357
3,906,367
3,906,381
3,906,471
3,906,506
3,906,522
44 : 3,905,320
3,905,481
3,906,242
45 : 3,905,186
3,905,187
3,905,210
3,905,300
3,905,381
3,905,596
3,905,860
46 : 3,905,644
3,905,702
47 : 3,905,135
3,905,650
3,905,999
3,906,358
48 : 3,905,061
3,905,082
3,905,094
3,905,115
3,905,124
3,905,214
3,905,319
3,905,338
3,905,414
3,905,422
3,905,426
3,905,427
3,905,432
3,905,446
3,905,553
3,905,576
3,905,586
3,905,631
3,905,688
3,905,708
3,905,773
3,905,837
3,905,873
3,905,915
3,906,036
3,906,157
3,906,167
3,906,204
3,906,224
3,906,283
3,906,352
3,906,433
3,906,449
3,906,479
3,906,487
49 : Re.28,549
3,905,694
3,906,118
51 : 3,905,075
3,905,084
3,905,391
3,905,617
3,905,911
3,905,969
3,906,312
3,906,377
53 : 3,905,102
3,905,183
3,905,200
3,905,219
3,905,344
3,905,594
3,905,608
3,905,784
3,906,081
3,906,193
3,906,201
3,906,353

3,906,354	3,906,061	3,905,284	3,905,592	3,905,797	3,906,014
3,906,391	55 : 3,905,168	3,905,311	3,905,595	3,905,886	3,906,086
3,906,455	3,905,180	3,905,364	3,905,734	3,905,889	3,906,294
3,906,481	3,905,238	3,905,488	3,905,736	3,905,931	3,906,327
54 : 3,905,127	3,905,260	3,905,574	3,905,786	3,905,980	

Design Patents

1 : 236,832	236,814	236,824	18 : 236,783	236,843	37 : 236,797
4 : 236,831	236,819	236,825	236,798	29 : 236,796	236,829
236,855	236,821	236,851	236,815	236,802	39 : 236,766
236,856	236,822	9 : 236,812	236,817	236,828	236,816
6 : 236,767	236,826	12 : 236,807	20 : 236,801	31 : 236,836	236,830
236,777	236,833	13 : 236,799	21 : 236,776	33 : 236,804	236,839
236,778	236,834	17 : 236,773	25 : 236,779	34 : 236,838	40 : 236,788
236,785	236,842	236,790	236,789	236,841	42 : 236,782
236,786	236,846	236,791	236,805	36 : 236,800	236,784
236,787	236,852	236,823	236,820	236,837	45 : 236,808
236,794	236,853	236,847	26 : 236,780	236,844	53 : 236,795
236,803	8 : 236,813	236,849	27 : 236,818	236,850	55 : 236,857
236,809					

Plant Patents

34 : 3,782	39 : 3,781	3,783	3,784	3,785

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE

Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE

C. Marshall Dann, *Commissioner*